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OF THE

TORREY BOTANICAL CLUB.

VOL. VI.

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OF THE
TORREY BOTANICAL CLUB.

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§ 1. Geographical Distribution of the Ferns of North America,

By John H. Redfield.

For many reasons, writers upon the Flora of North America have found it convenient and useful to limit their province to that part of the continent lying north of Mexico, excluding also the West Indian Islands. In considering the distribution of the Ferns of North America a similar limitation will be followed, which will exclude a large number of tropical forms that can be better studied in connexion with South American or Caribbean geography.

As Ferns are for the most part very dependent upon shade and moisture, their distribution over the continent will be largely determined by the rain-fall of the different portions; and the same conditions which locate the forest regions, will show us where we may expect to find the largest number of species and the greatest development in number and luxuriance of individuals. And as many species live only in the crevices of rocks, or root only in rock-loving mosses, they find in the rugged cliffs of mountain sides all the necessary conditions.

So, as we might expect, the eastern portion of the continent—traversed from N. E. to S. W. by the Appalachian range of mountains which receive and condense the moisture of the winds from the Gulf of Mexico and the Atlantic—furnishes the greatest number of species. Near the Gulf, the moisture of the atmosphere is accompanied by sufficient heat to permit the establishment of many species belonging to the Caribbean province. These soon disappear as we go northward, and as we proceed into Canada and the British possessions, many of the Alleghanian forms die out, and are succeeded by more hardy and cold-enduring species. A few of these continue into high arctic latitudes. Passing now westward beyond the Alleghanian slopes, into the flat, treeless prairies of the Mississippi valley, and still farther, into the arid plains which extend to the foot of the Rocky Mountains, we have a vast region, in which the species gradually diminish in number, and finally almost entirely disappear. Even in the Rocky Mountains we find many of the needed conditions wanting. An atmosphere almost devoid of moisture through much of the year, and so free from cloud as to give burning effect to the direct rays of the sun, limits the fern growth to deep rock clefts and to the valleys of snow-fed streams. A few Boreal and Siberian forms have crept downwards from the north, meeting some of the drought-resisting species which have made their way from Mexico.

Beyond the Rocky Mountains, we enter a widespread desert, utterly incompatible with fern life, though the island-like snow-covered mountain ridges which here and there emerge from the vast expanse of the thirsty plains, occasionally give shelter to a few hardy species.

But, as we approach the western borders of the continent, the noble coniferous forests of the Cascade Mountains and of the Sierra Nevada again offer inviting conditions, and accordingly we have here a larger proportion of ferns than we have seen since leaving the Appalachian regions. In California, the dry plains which lie between the Sierras and the coast range, again interrupt the fern-life which, however, re-appears upon the coast range. As we go northward along this western coast, the rains become more abundant and the ferns more luxuriant; but as we go towards Southern California, aridity again prevails, restricting the number of species and individuals, and modifying their types. Abundant as is the fern-growth of Alaska, Washington, and Oregon, the number of species is much less than upon the Eastern border of the continent. A few species are peculiar, while the remainder are Asiatic forms which seem to have made their way across the Straits or over the Aleutian Isles even as far south as California, there meeting a few types which have their homes in the Andes.

The number of species which inhabit North America as here defined, is about 125. They may be arranged in six geographical divisions, viz: 1. Cosmopolitan; 2. Boreal; 3. Appalachian; 4. Pacific; 5. New Mexico or Central; 6. Tropical. In enumerating the species we italicize those which are also found in the old world.

I. COSMOPOLITAN: widely distributed over the globe, in both temperate and tropical regions.

Pteris aquilina, L. *Asplenium Trichomanes*, L.

The first of these, thriving in sandy barrens, occurs abundantly in both the old and new world and in the islands, from Lapland in the north to New Zealand and Tasmania in the south. In North America it extends from Labrador and Alaska southward to the isthmus, avoiding only the arid and alkaline plains of our western interior. The other species of this group thrives only in the crevices of shaded rocks, and this condition only, seems to limit its distribution. Throughout the globe it is represented almost as universally as the *Pteris*. There are a few others of our species which are so widespread as almost to claim a place in this division, but which it will be more convenient to consider in the other groups.

II. BOREAL: inhabiting (with a few exceptions) the northern portion of the United States, extending through Canada and British America, some species even reaching Labrador, Greenland and Alaska, and nearly all represented also in the northern portions of the old world.

Phegopteris polypodioides, Fée.
" *Dryopteris*, (L.) Fée.
" *alpestris*, (Sw.) Mett.
Struthiopteris Germanica, Willd.
Cryptogramme crispa (L.) R. Br.
Cheilanthes argentea, (Gm.) Kunze.
Cystopteris fragilis, (L.) Bernh.
" *montana*, (Sw.) Link.

Aspidium Lonchitis, (L.) Sw.
" *aculeatum*, (L.) Sw.
" *filix-mas*, (L.) Sw.
" *fragrans*, (L.) Sw.
" *spinulosum*, Sw.
Scolopendrium vulgare, Sm.
Asplenium viride, Huds.
" *septentrionale*, L.
Pellæa gracilis, (Mx.) Hk.
Lomaria Spicant, (L.) Desf.
Woodsia hyperborea, (Sw.) R. Br.
" *glabella*, Hk.
" *Ilvensis*, (L.) R. Br.
" *Oregana*, D. C. E.
Botrychium Lunaria, (L.) Sw.
" *matricariæfolium*, A. Br.
" *lanceolatum*, (Gm.) Angst.
" *simplex*, Hitchc.
" *boreale*, Milde.

Of the species here grouped, we note that *Phegopteris alpestris* has only been observed in North America upon the western coast—coming down as far as California, according to Mr. Baker—and upon the coast of Greenland. *Aspidium filix-mas*, so abundant in the old world, is very restricted upon this continent. It is occasionally found in Canada and near Lake Superior, and occurs rarely in the Rocky Mountains. *Aspidium aculeatum*—so widespread in some of its forms—is local upon our continent, and has not been seen below about 42 degrees. *Scolopendrium*, so abundant in Great Britain, is still more restricted here, and seems confined to a few rocky glens which open into the ancient basin of the great lakes. *Asplenium septentrionale*, widely distributed in the mountains and colder portions of Europe and Asia, has on our continent been seen only in the Rocky Mountains, where it reaches as far south as latitude 32 degrees. *Asplenium viride* does not penetrate the United States, nor is *Woodsia hyperborea* represented with us, unless *W. glabella* be viewed as a variety of it. *Woodsia Oregana* might perhaps be ranked with the Pacific or Rocky Mountain species, but as it has been noticed as far eastward as Lake Superior, it may claim place with the boreal species, though restricted to the new world, so far as known. *Cystopteris montana*, a high northern species of the old world, has been seen in Alaska, also far north in the Rocky Mountains, and on the north of Lake Superior, and in Labrador; while *Cystopteris fragilis* is so widespread on the globe, as almost to deserve a place in our first division, and were it not for its northern proclivities might be called an Appalachian species. *Pellæa gracilis* would be an exclusively American form, but for the fact that it occurs in the Himalaya Mountains, where several other of our American species also appear. *Lomaria Spicant*, common in the northern regions of the old world, appears only on our western border. *Botrychium Lunaria*, frequent throughout northern Europe and not rare in British America, barely enters our own boundaries, but the other *Botrychia* of this group have nearly all been occasionally found within our limits, and are perhaps more abundant than is supposed, their small size and isolated habit enabling them to elude detection. *Cheilanthes argentea* is a Siberian species which reaches the Aleutian islands, and perhaps Alaska, and so must be included in our list.

III. APPALACHIAN: extending throughout the mountain and hilly regions of the States east of the Mississippi, often to the coast, and northward into Canada, and in a few instances also inhabiting the old world.

Polypodium vulgare, L.
Phegopteris hexagonoptera, (Mx.) Fée.
Onoclea sensibilis, *L.*
Aspidium Goldieanum, Hk.
" marginale, Sw.
" acrostichoides, Sw.

Cheilanthes vestita, Willd.
" tomentosa, Link.
Pellæa atropurpurea, (L.) Link.
Adiantum pedatum, L.
Camptosorus rhizophyllus, (L.) Link.
Asplenium filix-fœmina, L.
" *thelypteroides*. Mx.
" angustifolium, Mx.
" *ebeneum*, Ait.
" *ruta-muraria*, L.
" pinnatifidum, Nutt.
" montanum, Willd.
" Bradleyi, D. C. Eaton.
Dicksonia punctilobula, (Mx.) Knz.
Aspidium Thelypteris, (L.) Sw.
" Noveboracense, (L.) Sw.
" *cristatum*, (L.) Sw.
Cystopteris bulbifera, (L.) Bernh.
Woodsia obtusa, (Willd.) Torr.
Lygodium palmatum, L.
Osmunda regalis, L.
" *Claytoniana*, L.
" *cinnamomea*, L.
Botrychium Virginicum, (L.) Sw.
" *ternatum*, Sw.
Ophioglossum vulgatum, L.

Asplenium marinum, L.
Woodwardia Virginica, (L.) Sm.
" *areolata*, (L.) Moore.
Schizæa pusilla, Pursh.

Of the species in this division we remark that *Onoclea sensibilis*, though absent from Europe and most of Asia, appears in Manchuria and Japan. I am not aware that it now occurs in the Western portion of our own continent, but it is a very interesting fact that it has been discovered in a fossil state in the eocene tertiary on the eastern border of Montana. *Cheilanthes vestita* is hardly found north of 41 degrees extending southwesterly along the mountainous region to about 34 degrees. *C. tomentosa* seems to prevail along the western slope of the mountains, and reappears in the mountains of Arkansas and in the Rocky mountains. *Pellæa atropurpurea* stretches to the northwest even to Slave Lake and southwest to the Ozark Mountains, and occurs sparingly in the Rocky Mountains. Our lovely *Adiantum pedatum* is wanting in Europe, but appears in the Himalayas, in Manchuria and Japan, again in Alaska, thence along our western coast as far as California. *Camptosorus rhizophyllus* is limited to this district, but an allied species without auricles, occurs rarely in Siberia. *Asplenium filix-fœmina* is almost a cosmopolite, but its fellow in the section *Athyrium*, (*A. thelypteroides*), occurs elsewhere only in Asia. *Asplenium ebeneum* is rather tropical in its relations, and extends into tropical America as far as Peru, and appears in the old world only in South Africa. Yet with us it extends north to about 45 degrees. *Asplenium montanum* is appropriately named, and is strictly Appalachian. It has been observed as far north as Ulster Co., N. Y., extending thence southwesterly to Alabama. *Asplenium pinnatifidum* is rare and local, and has been reported, so far as we know, only from Pennsylvania, North Carolina, Southern Illinois, Missouri, and Arkansas. It has been erroneously considered by some as a variety of *Camptosorus rhizophyllus*, but not only do the generic distinctions hold which Hooker indicated; but its habit is entirely different. Instead of running freely over the surface of rocks, rooting in the moss which covers them, it grows deep in the retreating crevices of precipitous cliffs, rooting itself most tenaciously to the rock, and is rarely or never proliferous. *Asplenium Bradleyi* has as yet been seen only in East Tennesee and Kentucky (See Vol. IV. p. 11 et infra § 3.) *Aspidium Thelypteris* is widespread in the northern hemisphere, and less so in the southern, but its very near relative *A. Noveboracense* is strictly Appalachian. So also are the rest of the *Aspidia* of this division, except *A. cristatum*, which also appears in Europe. *Lygodium* is for the most part a tropical genus, and most of its species are widespread in warm regions. Our own beautiful species, however, is strictly confined to this division, and occurs but rarely in it, usually in wet, sandy alluvium. Of the three *Osmundæ*, *O. regalis* is almost cosmopolitan, *O. cinnamomea* extends from far north into the tropical regions of South America, and though wanting in Europe, it reappears in Eastern Asia, while *O. Claytoniana* is another species common only to the Appalachian and the Himalayan region. All three are wanting west of the Rocky Mountains. Both of the *Botrychia* of this group are occasionally found in the northern hemisphere of the old world.

The last four species of this group are rather maritime than Appalachian. *Asplenium marinum* is strictly a littoral species, but it is somewhat doubtful whether it is entitled to a place in our Catalogue. It is said to have been collected upon the coast of Newfoundland by Kendal more than thirty years ago, but later collectors have not confirmed it. *Woodwardia areolata* is limited to the marshes of the seaboard States, from Cape Cod southward. *Woodwardia Virginica* has about the same range, but also appears in the regions bordering on the St. Lawrence and the great lakes. Our little *Schizæa* is known only in the cedar swamps of New Jersey, at three or four points over a limit of about thirty miles, although it is said to have been collected in Newfoundland many years ago. Perhaps thorough search in appropriate localities may yet prove its range wider than we know.

IV. PACIFIC: extending along the western border of the continent at points from Alaska to California, in a few cases appearing also in the Rocky mountain region.

Polypodium falcatum, Kellogg.
" intermedium. Hk., & Arn.
" Californicum, Klf.
" Scouleri, Hk., & Arn.
Gymnogramme triangularis, Klf.
Notholæna Newberryi, Eaton.
Cheilanthes Californica, (Nutt.) Mett.
" gracillima, Eaton.
Pellæa Breweri, Eaton.
Pellæa andromedæfolia, (Klf.) Fée.
" Bridgesii, Hk.
" densa, (Brack.) Hk.
" ornithopus, Hk.
Aspidium munitum, Klf.
" Californicum, Eaton.
" argutum, Klf.
Woodsia scopulina, Eaton.

One or two additional species occur in California, which will be more appropriately considered in the next group. *Gymnogramme triangularis* extends from Vancouver's Island to Southern California and re-appears in Ecuador, South America. *Notholæna Newberryi* is only known at present in Southern California (See BULLETIN, Vol. IV., p. 12.) *Cheilanthes gracillima* has been noted from latitude 44 degrees to 35 degrees. Mrs. Lyell must be wrong in ascribing it to Missouri. *Woodsia scopulina* has been seen from latitude 49 degrees to Columbia River, and appears also in the Rocky Mountains as far south as latitude 39 degrees. We as yet know too little of the range of most of these species to assign a precise limit.

V. NEW MEXICAN: inhabiting the central mountain regions of New Mexico and Colorado, many of the species extending thence into Mexico and some even to South America, and a few of them also occurring in California.

Gymnogramme pedata, (Sw.) Klf.
Notholæna sinuata, (Sw.) Klf.
“ ferruginea, (Willd.) Hk.
“ candida, M. & G.
“ cretacea, Liebm.
“ dealbata, (Pursh.) Knz.
“ Fendleri, Knz.
Cheilanthes aspera, Hk.
“ Fendleri, Hk.
“ Lindheimeri, Hk.
“ Eatoni, Baker.
Cheilanthes lanuginosa, Nutt.
“ Wrightii, Hk.
“ microphylla, Sw.
Pellæa pulchella, (M. & G.) Fée.
“ flexuosa, (Klf.) Link.
“ Wrightiana, Hk.
Adiantum Chilense, Klf.
Woodwardia radicans, (L.) Sw.
Aspidium juglandifolium, Knz.
Aneimia Mexicana, Klotzsch.

The prevalence of the drought-resisting genera *Notholæna*, *Cheilanthes* and *Pellæa* in this list will be at once noticed. The precise range of many of these we have yet to learn. *Gymnogramme pedata*, *Notholæna ferruginea*, *N. candida*, *N. cretacea*, *Cheilanthes microphylla*, are all known to extend into Mexico and Central America. *Adiantum Chilense* and *Woodwardia radicans* also occur in California, but their relations are rather with this group, and the latter species is the only one of the group which also appears in the old world.

VI. Tropical: inhabiting the border of the Gulf of Mexico, most of the species extending into the West Indies and Tropical America:

Acrostichum aureum, L.
Vittaria lineata, (L.) Sw.
Polypodium Plumula, Kunze.
“ *incanum*, L.
“ aureum, L.
“ Phyllitidis, L.
Cheilanthes Alabamensis, Knz.
Pteris Cretica, L.
“ *longifolia*, L.
Adiantum Capillus-Veneris, L.
Blechnum serrutatum, Mx.
Asplenium dentatum, L.
“ myriophyllum, Presl.
Aspidium patens, Sw.
“ Ludovicianum, Knz.
“ *unitum*. (L.) Mett.
Nephrolepis exaltata, (Sw.) Schott.
Trichomanes Petersii, Gray.
“ *radicans*, Sw.
Aneimia adiantifolia, (L.) Sw.
Ophioglossum bulbosum, Mx.
“ *nudicaule*, L. fil.

Of the above, we note that *Trichomanes Petersii* is quite local, having been seen only in Alabama and Florida. *Cheilanthes Alabamensis* reaches through Texas into New Mexico. *Polypodium incanum* extends farther north than any other in the group—reaching Virginia, on the sea board, and extending up the Mississippi Valley into Illinois, but avoiding the colder mountainous region between. *Adiantum Capillus Veneris* reaches N. Carolina on the east of the mountains and Missouri on the west.* This species is almost cosmopolitan and reaches high latitudes in the old world, but with us is limited as above. The two species of *Pteris* of this group also extend around the globe except in high latitudes.

Of the 125 species here enumerated, 69, or about 55 per cent., are found in the new world only, and of these 69, about 53, or over 42 per cent. of the whole, are restricted to the limits we have defined, except that a few of them extend more or less into Mexico.

We have then, 72 species left, which we share with other portions of the world—some of which are represented in more than one other region. A brief glance at the numerical relationship of these is all that we have space for.

We have 40 species in common with Europe, of which 4 are not found elsewhere.

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* It also reappears in Utah and Arizona.

We have 30 species in common with the Himalaya, or northern India, of which 2 are not found elsewhere.

We have in common with northern or eastern Asia 30 species, of which two are not found elsewhere. If we make a similar comparison with the Himalayan region and the north and east of Asia united, we have 46 species in common ! of which 5 are exclusive. If we add Europe to this comparison, we have 52 species in common, of which 26 are exclusive. We have also 29 species which occur in the West Indies, 26 which occur in Africa or southern Asia, 36 which inhabit South America, and 19 which occur in Polynesia. The preponderance of Asiatic forms in our fern flora will at once be perceived, and opens an interesting field of inquiry. Those wishing to enter upon it are referred to Dr. Gray's "Observations on the relation of the Japanese Flora to that of North America and of other parts of the northern Temperate Zone," in 6th vol. of Memoirs of Am. Acad. Arts and Sci., 2d series, also in Silliman's Journal, Sept., 1859. And in this connection the student will find the elaborate and excellent tables in Mrs. Lyell's "Geographical Hand Book of Ferns" of great service. Seldom has been brought together such a mass of botanico-geographical facts, so well systematized, and so convenient for use.

§ 2. **Hamilton College.**—The Catalogue of Hamilton College for 1874–'5 contains a feature that is rather novel, but certainly very desirable. In its (regular) mention of "The College Grounds," after a short statement of the design of the Curators of the College Grounds, with some historical matters—a part of which design is "to obtain specimens of every tree and shrub supposed to be hardy in the climate of Central New York—a resumé of the experience of the Curators is given in the shape of; (1) a list of the trees which have thus far proved tender in that climate, comprising nine evergreen trees and four deciduous; (2) of deciduous trees which have proved hardy and desirable, numbering eighty-seven species; (3) of evergreens which have been found hardy and worthy of the attention of planters, numbering twenty-eight species; (4) a list of hardy shrubs, numbering fifty-three species; (5) of trees and shrubs procured during the past year, and not yet tested, embracing twenty deciduous trees, thirty-seven evergreen trees, and nineteen shrubs.

From my knowledge of the college grounds, I am inclined to think that the list of hardy trees is not quite full. Most of the deciduous trees, and a large portion of the evergreen trees and of the shrubs, are natives. Among the trees and shrubs "not yet tested as to their hardiness," I notice a number of natives, several of them natives of the immediate vicinity of the college, and which are certainly tested as to the climate, whatever may be the effect upon them of cultivation.

The College Campus is situated upon a high hill, at the intersection of the Mohawk and Chenango valleys, overlooking a very large tract of the region whose peculiar botanical richness is shown in Paine's Catalogue; the cities of Utica and Rome lying far within the circle of vision. The hill is swept over by severe winds, however, and is as hard a place for plants as can well be found in the neighborhood, and plants found hardy there may safely be tried any-where in Central or Western New York. The Curators have for years not only planted and cared for the shrubs and trees imported and sold by the nurserymen, but made trial of the native shrubs and trees taken from the woods and swamps, and thus have not only succeeded in accumulating a vast deal of experimental knowledge of cultivable natives, but have succeeded in transforming the Campus into a park not surpassed in beauty by any college grounds with which I am acquainted.

Partly as cause and partly as effect of the work of the Curators with the native shrubs and trees, the grounds of several of the professors in the college have been adorned with beautiful and hardy native shrubs and trees, which are also, I am rather sorry to say, somewhat of a novelty, and which sometimes give the professors a reputation for great research in the direction of rare foreign plants. Some of the professors have also made great acquisitions to their gardens by domesticating native herbaceous plants. I forbear going into details here, as the gentlemen to whom I refer are far more competent in that respect than I. The BULLETIN would certainly be none the worse if it could obtain from Professors Owen Root, or Edward North, or C. H. F. Peters some record of their experimental knowledge of the desirable plants of Central New York. J. H. H.

§ **3. Trichomanes radicans,** Swartz—I found this fern last summer in a dozen localities within twenty miles of Mammoth Cave, in Edmonson County, Kentucky. I had gathered it the summer previous in the eastern part of the same State. It grows thriftily and is well fruited. I also found the *Asplenium Bradleyi*, Eaton, in one very limited locality in Edmonson county. I believe no one else has ever reported these ferns north of the State of Tennessee before.

LA FAYETTE, IND. JOHN HUSSEY.

§ **4. Sullivantia Ohionsis,** Torr. & Gr.—Mr. A. Harvey Young, of Hanover, Jefferson county, Indiana, sends us a specimen of this plant which he says is found growing upon the sides of some of the wet limestone cliffs of that county, and adds certain "characters that seem worth noticing, but are not found in the botanical textbooks." "Panicle bracted with 3-5 toothed obovate bracts. Leaves thickish, shining green above and whitish underneath. Base of petioles membranaceously dilated, those of the flower stem embracing it and bearing at the top a filiform stipule." The plant is more particularly described in Gray's Chloris, and under the name of *Saxifraga Sullivantii* in Torr. & Gray, p. 575. In none of the specimens that we have seen can we make out the filiform stipules to which Mr. Young refers.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

Note.—In printing the second number of Vol. VI. there was an error in the paging, that No. beginning with p. 12, instead of p. 9. To fill up this lacuna of four pages, we now print four pages of our local Catalogue, numbering them 9–12. The date of the Catalogue is not very material, most of the stations having been determined long ago. We stopped at the Carices, hoping that some one of the CLUB would devote himself to that difficult genus. As no one came forward, we have compiled the list from such reports as we had, being careful to put in nothing without good authority. Nevertheless, some errors may be found, which we hope will be corrected, and we doubt not considerable additions can be made before the end of 1879, when we purpose to publish a complete index to our local catalogue.

We have given a few of the Gramineae, but prefer to wait for the rest, and for the Cryplogams, till we receive further communications. We trust that all the members of the Club will furnish us at once with specimens of their Grasses from the various stations, to be submitted to the eminent authority of their President. Each specimen should be clearly labelled with the name of the collector, of the station, and with the habitat, and the date of collection, as far as possible.

Carex L.

C. polytrichoides, Muhl.; *Torrey's Catalogue;* Closter, common *Austin;* Yonkers, *Howe & Pooley;* Suffolk Co., *Miller;* Staten Island, common, *Britton.*

C. Willdenovii, Schk.; Haverstraw, *Austin.*

C. bromoides, Schk.; *Torr. Cat.;* Closter, common, *Austin;* common north, *Willis' Cat. Plant, Nov. Caes.*

C. teretiuscula, Good.; Swamps, common, *State Flora*, but it is not reported in the State in this vicinity; Closter, common *Austin*; Budd's Lake, *Porter, in Willis.*

C. vulpinoidea, Michx.; common in all districts.

C. stipata, Muhl.; common in all districts.

C. sparganioides, Muhl.; *Torr. Cat.;* Yonkers, *Howe & Pooley.*

C. arida, L.; said by Pursh to grow in loose sand, from New York to Virginia.

C. cephalophora, Muhl.; Closter, common, *Austin;* Suffolk Co., *Miller;* Staten Island, common, *Britton.*

C. Muhlenbergii, Schk.; Closter, common, *Austin;* Suffolk Co., *Miller.;* var. **enervis,** Boot, is given in Gray's Manual, with the note. "Hudson River, New York, *J. L. Russell,*" probably within our limits; Tottenville, *W. H. L.*

C. rosea, Schk.; common in all districts; var. **minor,** Boot; Patterson, *W. H. L.*

C. retroflexa, Muhl.; common on Palisades, *Austin;* Yonkers, *Howe & Pooley;* common on Long Island, *Ruger.*

C. tenella, Schk., Budd's Lake, Morris Co., N. J., *C. F. Parker;* Staten Island, *Ruger.*

C. trisperma, Dew.; New Durham, *Austin;* Manchester and north, *Willis Cat.*

C. canescens, L.; common; var. **vitilis,** Fries, Babylon, L. I., *W. H. L., Olney. auct.*

C. Deweyana, Schw.; Haverstraw, *Austin* [?]

C. exilis, Dew.; Suffolk Co., *Miller;* Manchester, *Willis Cat.*

C. sterilis, Willd.; *Torr. Cat.*; New Durham, *W. H. L.*; Closter, common, *Austin*; Suffolk Co., *Miller;* wet places, common, *Willis Cat.*

C. stellulata, L.; Rather common; Tottenville, Staten Island, *Britton*; Long Island, *Ruger, W. H. L.*; Yonkers, *Howe & Pooley*; var. **scirpoides,** Closter, common, *Austin;* Suffolk Co., *Miller.*

C. scoparia, Schk.; everywhere common.

C. lagopodioides, Schk.; everywhere common; *Torr. Cat., etc.*; var. **cristata,** Carey; Closter, *Austin;* Yonkers, *Howe & Pooley;* not uncommon on Long Island, *Ruger;* var. **mirabilis,** Olney; Yonkers, *Howe & Pooley.*

C. foenea, Willd; quite common on Long Island, Bergen Point, and elsewhere. A late bloomer, gathered as late as Aug. 29th, on Long Island, *W. H. L.*

Var. **sabulonum,** which is reported from Yonkers, Suffolk Co., and Staten Island, if the same plant that I have gathered under that name, is common enough about our shores, but I take it to be **C. silicea,** Olney.

C. straminea, Schk.; sparingly reported; Closter, common, *Austin*; Jamaica, etc., Long Island, *W. H. L.*

C. tenera, Dew., var. **major,** Olney; Wading River, *Miller.*

C. alata, Torrey; Wading River, *Miller.*

C. torta, Boot, Jerusalem; *Dr. S. H. Wright, in Olney, Fascic, III. No.* 5.

C. stricta, Lam.; *Torr. Cat.;* Closter, common, *Austin;* Yonkers, *Howe & Pooley;* Staten Island, very common, *Britton;* var. **strictior**; Long Island, *Ruger, W. H. L.*

C. salina, Wahl.; Tom's River, *Knieskern, in Willis Cat.*

C. crinita, Lam.; *Torr. Cat.;* common in all districts.

C. Barrattii, Schw. & Torr.: Monmouth Co., New Jersey, *Torrey Herbarium;* Manchester, *Willis Cat.*

C. irrigua, Smith; Budd's Lake, Morris Co., N. J. *Porter, in Willis Cat.*

C. livida, Willd.: Manchester, N. J., *Willis Cat.*

C. granularis, Muhl.; Closter, *Austin;* Yonkers, *Howe & Pooley;* Trains Meadows and New Lots, L. I., *Ruger;* Giffords, Staten Island, *Britton.*

C. pallescens, L.; Closter, *Austin;* Yonkers; *Howe & Pooley.*

C. conoidea, Schk.; *Torr. Cat.;* Patterson, N. J., *W. H. L.*; Morris Co., N. J., *Porter, in Willis Cat.;* Yonkers, *Howe & Pooley.*

C. grisea, Wahl.; Closter; common, *Austin;* Yonkers, *Howe & Pooley;* Woodhaven, &c., L. I., *Ruger.*

C. virescens, Muhl.; everywhere common.

C. triceps, Mchx.; Closter, *Austin;* Yonkers, *Howe & Pooley;* Morris Co., N. J. *W. H. L.*

C. platyphylla, Carey; Closter, *Austin;* Weehawken, N. J., Inwood, N. Y. Island, *Ruger;* Yonkers, *Howe & Pooley.*

C. retrocurva, Dew.; Closter, *Austin;* Yonkers, *Howe & Pooley.*

C. digitalis, Willd.; Closter, *Austin;* Yonkers, *Howe & Pooley.*

C. laxiflora, Lam.; common in all districts; var. **styloflexa**, Boot.; Closter, *Austin;* var. **plantaginea**, Boot, *Torr. Cat.;* Suffolk Co., *Miller*, var. intermedia, Boot, Suffolk Co., *Miller*, var. **blanda**, Hoboken, 1829, *Torr. Herb.*

C. oligocarpa, Schk.; *Torr. Cat.;* Closter, *Austin;* Yonkers, *Howe & Pooley.*

C. pedunculata, Muhl.; *Torr. Cat.;* Morristown, *W. H. L.;* Closter, *Austin.*

C. umbellata, Schk; Suffolk Co., *Miller.*

C. Emmonsii, Dew.; Closter, *Austin;* Yonkers, *Howe & Pooley;* Bablyon, L. I., *W. H. L.*

C. nigro-marginata, Schw.; *Austin;* Babylon, *W. H. L.*, *auct. Olney.*

C. Pennsylvanica, Lam.; Closter, *Austin;* *Torr. Cat.;* common throughout.

C. varia, Muhl.; Closter, *Austin;* Yonkers, *Howe & Pooley;* *Torr. Cat.?*

C. pubescens, Muhl.; Closter, *Austin;* Yonkers, *Howe & Pooley;* Weehawken, *Ruger.*

C. miliacea, Muhl.; *Torr. Cat.;* common.

C. scabrata, Schw.; Closter, *Austin.*

C. arctata, Boot.; Closter, *Austin.*

C. debilis, Mchx.; Closter, *Austin;* Chatham and Bergen Point, N. J., *W. H. L.;* Yonkers, *Howe & Pooley.*

C. extensa, Good.; Coney Island, *Allen.*

C. filiformis, L.; Closter, Rockland Co., Budd's Lake; does not fruit here, *Austin.*

C. lanuginosa, Mchx.; *Torr. Cat.;* Yonkers, *Howe & Pooley;* Newtown, L. I., *W. H. L.*, Closter, *Austin;* Suffolk Co., *Miller.*

C. vestita, Willd.; *Torr. Cat.;* Glendale, New Lots, L. I., and New Jersey, *Ruger;* Suffolk Co., *Miller*, Bablyon, *W. H. L.;* Staten Island, Tottenville, *Britton;* Closter, *Austin.*

C. striata, Mchx.; Closter, *Austin;* Suffolk Co., *Miller.*

C. riparia, Curtis; *Torr. Cat.;* Closter, *Austin;* Newtown, *Ruger.*

C. trichocarpa, Muhl.; Closter, *Austin.*

C. comosa, Boot.; Long Island, *Ruger*, *Miller;* Closter, *Austin;* Staten Island, common, *Britton.*

C. Pseudo-Cyperus, L.; *Torr. Cat.;* Closter, *Austin;* not uncommon at Maspeth, L. I., *Ruger;* Yonkers, *Howe & Pooley.*

C. hystricina, Willd.; Closter, *Austin;* Long Island, common, *Ruger*, *W. H. L.*

C. tentaculata, Muhl.; *Torr. Cat.;* Closter, *Austin;* Chatham, *W. H. L.;* common in New Jersey, *Willis Cat.;* Staten Island, common, *Britton;* Yonkers, *Howe & Pooley;* Long Island, *Ruger*, *Miller.*

C. intumescens, Rudge; common, *Willis Cat.*, *Ruger*, *Britton*, *Austin*, *Torr. Cat.*, *Howe & Pooley*; var. **gracihs,** Boot., near Giffords, *Britton.*

C. Grayii, Carey; Closter, *Austin.*

C. lupulina, Muhl.; *Torr. Cat.*; New Jersey, *Austin*, *Leggett*; Yonkers, *Howe & Pooley*; Suffolk Co., *Miller.*

C. lupiliformis, Sartwell; Hackensack Flats in woods, *Austin.*

C. folliculata, L.; *Torr. Cat.*; common, but not reported from Westchester Co.

C. subulata, Mchx.; Cedar swamp, Weehawken, *Torr. Cat.*; Closter, *Austin*; New Durham, *R. H. Brownne*; Long Island, *State Flora*; Staten Island, and South Amboy, *W. H. L.*

C. squarosa, L.; *Torr. Cat.*, common in all districts.

C. utriculata, Boot; Hackensack swamps; N. R. R. of N. J., between Bergen and New Durham, still immature June 29th, *W. H. L.*; Long Island, *Ruger*, *Miller.*

C. monile, Tuckerman; Closter, *Austin.*

C. bullata, Schk.; Closter, *Austin.*

GRAMINEAE.

Leersia, Solander.—**L. Virginica,** Willd.; Bloomingdale, *Torr. Cat.*; common, but not reported from Suffolk Co.—**L. oryzoides,** Swartz; *Torr. Cat.*; common.

Zizania, Gronov.—**Z. aquatica,** L.; *Torr. Cat.*; common; West New Brighton, *G. W. Wright*, the only station reported on Staten Island. Has it been found on New York Island?

Alopecurus, L.—**A. pratensis,** L.; in low meadows, *Torr. Cat.* —**A. aristulatus,** Mchx.; Closter, *Austin*; Bergen Point and Palisades, but possibly *A. geniculatus*, if there is a distinction, as Dr. Torrey, in *State Flora*, doubts. I have found it in bloom at Bergen Point in April, *W. H. L.*

Phleum, L.—**P. pratense,** L.; commonly cultivated and everywhere escaping.

Vilfa, Adans., Beauv.—**V. aspera,** Beauv.; Harsimus, *Torr. Cat.*; Harlem River, *W. H. L.*; Suffolk Co., *Miller & Young.*; common on Staten Island, *Britton*; Closter, *Austin*—**V. vaginaeflora,** Torr.; Sandy fields about Greenwich [!] also in New Jersey, *Torr. Cat.*; Spuyten Duyvil, *W. H. L.*; Staten Island, common, *Britton*; Closter, *Austin*; Suffolk Co., *Miller & Young.*

Sporobolus, R. Br.—**S. compressus,** Kunth.; in sandy pine woods, *Torr. Cat.*—**S. serotinus,** Gray.: Suffolk Co., *Miller.*, New Jersey, *Willis Cat.*

§ 5. **New Fungi from New Jersey.**—The fungi here noticed were sent me from New Jersey by Mr. J. B. Ellis. It is not known that they occur in New York, nor do I find any described species with which they agree. They are therefore published as new.

Peridermium pyriforme, Pk.—Peridia erumpent, large, white when evacuated, the cells subrotund, with a paler margin, marked with radiating striations, spores obovate, pyriform, or oblong-pyriform, acuminate below, .0015–.0025 inch long.

Bark of pine branches. The specimen is labelled "Newfield, N. J.;" but Mr. Ellis informs me that it may have been collected in Georgia, and been placed by accident among his New Jersey specimens.

In the dried specimens the peridia are mostly compressed, about one-fourth of an inch long, and scarcely exserted above the surface of the bark. The spores are pale yellow; but probably they are more highly colored when fresh. The acumination is generally acutely pointed, and it is sometimes so elongated as to make the spore appear clavate. It is one of the most distinctive features of the species.

Rœstelia Ellisii, Pk.—Spots yellow, red, or brown; subicular projections clustered or scattered, ovate, greenish or yellowish; peridia cylindrical, single at the apices of the projections, the laciniæ remaining united at the apex, the cells linear, subflexuous, smooth; spores subglobose, minutely rough, brownish, .00065–.00075 inch in diameter.

Under side of living leaves of the Shad-bush, *Amelanchier Canadensis.* Newfield. September.

This species is related to *R. transformans*, Ellis, from which it differs in its paler, shorter, and differently shaped subicular projections, the smooth cells of the peridia, and the apically united laciniæ. In this last character an affinity with *R. cancellata*, Reb., is indicated. The subicular projections also imitate, to some extent, the form of the peridium in that species. They might easily be mistaken for small insect galls. The spores extend down in these subicular processes below the apparent base of the true peridium. The species is dedicated to Mr. Ellis, who discovered it. It is the fourth Rœstelia known to attack the Amelanchier, three occurring on the living leaves, and one on the unripe fruit.

A form of *R. transformans* has been sent me in which the subicular projections are scattered, not clustered as in the specimens originally described.

Helminthosporium septem-septatum, Pk.—Effused in a thin, indeterminate, blackish brown stratum; flocci simple, slender, flexuous, colored, septate; spores fusiform, pale and triseptate when young, colored and seven-septate when mature, .0011–.0015 inch long.

Decaying wood of an old oak stump. Newfield. May.

Under a lens the flocci appear somewhat tufted, but the tufts are so confluent or crowded that to the naked eye they seem to form a nearly even, velvety stratum. The species is closely related to *H. fusisporum*, Berk., which is said to have the spores narrower than the flocci. In the present species the spores are decidedly broader than the flocci, these being only .0002 inch in diameter, while the spores are .0003–.00035 inch.

Peziza aberrans, Pk.—Minute, waxy, erumpent, rounded or elliptical when moist, hysteriform when dry; disk pallid or orange-tinted, surrounded by a narrow, blackish margin; asci large in proportion to the size of the plant, subfusiform; spores crowded or biseriate, oblong or oblong-clavate, obscurely triseptate, colorless; .0006–.0008 inch long.

Dead stems of *Andropogon*. Newfield. Autumn and winter.

The septa of the spores, though obscure, indicate an affinity with the genus Patellaria; but the texture and general characters of the plant show such a close relation to *Peziza erumpens*, Grev., that it seems best to place it for the present among the Pezizas next to that species.

CHAS. H. PECK.

§ 6. **Publications received.**—1. *Psyche*, organ of the Cambridge Entomological Club. Jan., 1875.—2. *Palestine Exploration Society, Third Statement*. Jan., 1875: 78, E. 9th St., N. Y. It is principally taken up with the "Identification of Mount Pisgah," by J. E. Paine. At the end of the main article is "A List of Plants collected between the two Zargas, Eastern Palestine, in the spring of 1873," by the same author, embracing 37 pages. It includes twelve new species, described and named by Mr. Paine, as follows: Silene brevipes, Trigonella minima, Trifolium velivolum, Cephalaria tenella, Cerinthopsis foliosa, Phelipæa incana, Salvia Peratica, Plantago phæopsis, Gagea monticola, Allium lachnophyllum, Carex eremitica, Bromus argypheus. The list does not embrace all the plants observed, but only those collected and identified. The region explored is that lying east of the Dead sea and lower Jordan—*i. e.*, old Moab and Gilead—and some of the new species come directly from Nebo and Pisgah. The plants, as might be expected, are very different from our North American species, and yet a few familiar ones appear among them: *e. g.*, Nasturtium officinale, Sinapis arvensis, Capsella Bursa-pastoris, Holosteum umbellatum, Malva rotundifolia, Erodium cicutarium, Medicago lupulina, Vicia sativa, Galium aparine, Filago Germanica, Cichorium Intybus, Anagallis arvensis, Samolus Valerandi, Veronica Anagallis, Marrubium vulgare, Plantago lanceolata, Habenaria tridentata, Ornithogalum umbellatum. Of the ferns mentioned nearly all are familiar here or in England.—3. *University Necrology*, from the Proceedings of the University Convocation, held at Albany, N. Y., July 29th, 30th, and 31st, 1873, contains a brief memorial of Dr. John Torrey, by Prof. D. S. Martin.—4. Catalogue of the Phœnogamous and Filicoid Plants of New Castle Co., Del., by Edward Tatnall, Wilmington, Del., 1860, an old but still valuable catalogue.—5. Schedule of Prizes offered by the Massachusetts Horticultural Society for the year 1875.—5. Botanical Contributions by Asa Gray, from the Proceedings of the American Academy of Arts and Sciences, May and Oct., 1874, Vol. X. (1) A Synopsis of North American Thistles; (2) Notes on Borraginaceæ; (3) Synopsis of North American Species of Physalis; (4) Characters of various New Species—all but one western, that one is Scirpus (Eleocharis) Wolfii, collected by Prof. John Wolf in Fulton Co., Ill. Dr. Gray has specimens collected in the same region in 1861 by Elihu Hall, and thinks it will prove not uncommon. "The spike as to form and imbrication of the scales is much as in S. tenuis, S. compressus, etc.; but the achenium, with its several longitudinal ribs and delicate transverse lineation, is upon the plan of that of S. acicularis. From Torrey's *Emplectocladus fasciculatus*, and two or three other species, a sub-~~order~~ of Prunus, Emplectocladus, is formed. A synoptical table of *Chanactis*, D C., is given in connection with a new species, *C. attenuata*, from Arizona. Mr. E. L. Green, who has removed to California, has already detected there several of the new species enumerated.—5. The New York *Tribune*, Feb. 1st, contains a very surprising account, by Mrs. Mary Treat, of Vineland, N. J., of the carnivorous use of the supposed float-bladders of Utricularia.—6. From Prof. G. C. Swallow, State Geologist of Missouri, we have received (1) Geological Report of S. W. Branch of Pacif. R. R., 1859, with a catalogue of Trees and Shrubs; (2) Report of the Commissioners of Statistics of the State of Missouri, also with a catalogue of Trees, Shrubs, and Vines, 1867; (3) Report of the Curators of the State University, including the Agricultural and Mechanical College, 1874.

§ 7. **Chicago Botanical Gardens.**—Sixty acres have been set apart in the South Park of Chicago for a Botanic Garden, and Mr. H. H. Babcock, the Director, solicits contributions, "especially of seeds, cuttings, living plants, and herbarium specimens."

§ 8. **Torrey's Peak.**—All botanists are interested in the perpetuity of this name, but as there is another local designation, some anxiety has been manifested as to the probability of the latter prevailing over that given by Dr. Parry. In view of this apprehension the President of our Club wrote to Prof. Hayden, of the United States Geological Survey of the Territories, who in reply states that there is no possibility of Dr. Torrey's name being superseded by any other. It has priority of date, and is on all the maps of the survey.

§ 9. **Poisoning by Cypripedium.**—Prof. H. H. Babcock, in a communication to *The Pharmacist*, Chicago, January, 1875, states that, being especially susceptible to poisoning by *Rhus Toxicodendron*, he for several years took every precaution against it. He not only was careful to avoid contact with the plant, but would not collect specimens of other plants growing near the *Rhus*, and went so far as to avoid handling fresh specimens gathered by others for fear these had been in contact with it. Notwithstanding all this, he found that late in May or early in June of each of several successive years he was so severely poisoned as to be confined to his room for several days, his face presenting the appearance usual in poisoning by *Rhus*. Upon referring to his field notes, he found that each season the poison manifested itself the day after he had collected either *Cypripedium spectabile*, or *C. pubescens*, and feels quite convinced that in his case the unpleasant effects were due to these heretofore unsuspected plants. Prof. H. asks for experiment to determine if his view is correct. Have any of the readers of the BULLETIN any observations bearing upon the matter?

G. T.

§ 10. **Spiraea Aruncus.**—This plant grows abundantly in the "Green river country," Kentucky. Both Gray and Wood (Botanist and Florist) describe it as "calyx, without bractlets" (Gray), "bractless" (Wood), whereas my specimens uniformly show "a bractlet." No doubt the mistake has been made from the fact that the bractlet is deciduous, falling off some time after the flower opens, indeed, but before the fruit is ripe.

JOHN HUSSEY.

LAFAYETTE, IND.

§ 11. **Plants for Sale.**—Sets of Dr. E. Palmer's Florida and Bermuda marine algæ; also small sets of Kellogg & Hartford's California Plants, and Ghiesbreght's Chiapas (Mexico) Plants for sale with Prof. Daniel C. Eaton, New Haven, Conn.—A few sets of Dr. Palmer's other plants from East Florida and the Keys may be obtained of S. Watson, Cambridge, Mass., at $8 the hundred.

§ 12. **Silphium.**—Are *Silphium integrifolium* and *S. trifoliatum* now regarded as two distinct species or only varieties of one? I am inclined to the view that they are only varieties. While botanizing on the Western prairies, I have often found two varieties so varying in their characters as to render it very difficult to determine where they should be placed—whether under S. integrifolium or S. trifoliatum as described by Gray. In 1866, on the prairies of Kansas, I found eighteen stalks or stems growing from one and the same root. Eleven of these stems had their leaves *all opposite* in pairs. Seven of them were trifoliate from the *lowest to the uppermost* leaves. Stems grooved, rather rough, but not 4-angular save a few which were very slightly so: about 5° high: panicle loose: achenia not answering perfectly to the description of either of the above mentioned species.

GEO. SCARBOROUGH.

VINELAND, N. J.

§ 13. **Painesville, Ohio.**—For several years I have noticed that in the autumn *Scirpus atrovirens*, Muhl., and *S. polyphyllus*, Vahl., are frequently *viviparous*, producing on the spikelets small bulbs crowned with small leaves. As the season advances they mature and fall, the heavy end striking the mud. They send out roots (there are rudimentary roots before the bulbs fall) and form new plants.

Mr. Watson informs me that specimens of *S. polyphyllus* showing these viviparous growths are in the Herbarium at Cambridge, collected in Connecticut by Dr. Barratt and in Virginia by Mr. Curtiss, but he is not aware that they have been noticed in *S. atrovirens.*

Last year I was fortunate in discovering the long lost *Fissidens hyalinus*, Wils. and Hook., but this year I failed to detect it in the same locality. I send also specimens of *Amarantus Blitum*, L., and *Hydrodictyon utriculatum*, Roth, collected in this vicinity.

H. C. BEARDSLEE.

§ 14. **Supposed revival of an ancient plant.**—Th. Heldrich, Prof. of Botany in Athens, thinks that an unknown *Glaucium* which has appeared among the scoria of the Laurian silver mines may have lain dormant there from the time of the cessation of the working of these mines, 40 years B. C., till the recent re-examination of this scoria by the Company whose dispute with the Greek government has of late attracted attention. The locality gives an interest to the story greater than the probability of the supposition.

§ 15.—NEW HEPATICÆ, by C. F. AUSTIN.

1. **Riccia Frostii,** *n. sp.* Fronde parva orbiculari solidiuscula (subcavernosa?) tenui plana cineraceo-viridi subpalmatim radiatimve divisa fibroso-reticulata minuteque foveolata subtus esquamosa haud carinata radiculis intus fere tota lævibus instructa, margine nuda angustissime membranacea nonnumquam obsolete purpurea, laciniis subsphathulato linearibus subdichotomis, lobis apice leniter dilatatis subtruncatis indistincte emarginatis, sporangiis permultis in medio frondis dispersis subtus valde prominentibus, sporis parvis (vix 1-500 unc. metientibus) fuscis obscure angularibus biconvexis in circuitu subrotundis minute granuloso-papillosis obscure minute reticulatis opacis subnigro-marginatis in statu siccato lateribus undique valde depresso-concavis.

Nevada, *S. Watson;* communicated by *C. C. Frost, Esq.* Colorado, *Wolf* and *Rothrock;* communicated by *Dr. James.* (Associated with *R. crystallina.*)

Fronds, 5—7 lines, and lobes ½—¾ of a line broad. Resembles *R. crystallina* in some respects; but that has the larger, thicker, and vesiculose frond much more coarsely pitted in the upper surface, with the divisions much broader, rootlets strongly papillose within, spores twice the diameter, coarsely tuberculated, the sides not concave when dry, &c.

R. glauca has a larger frond of a different texture above, and more broadly membranaceous on the margin; spores $\frac{1}{300}$ of an inch in diameter, coarsely reticulated, the sides not depressed when dry; rootlets as in *R. crystallina,* &c.

I have recently received a single specimen of this species from *Dr. H. C. Beardslee,* collected on alluvial soil near Painesville, Ohio, which differs from the Rocky Mountain specimens above described as follows:

Frond solid, orbicular, its divisions somewhat papulose-squamulose and frequently slightly tinged with purple along the margins, about an inch in diameter, divided to the centre into numerous narrow laciniæ which are concave-canaliculate above (both in the dry and in the moist state), lobes almost linear, sporangia much less numerous.

2. **Riccia Watsoni,** *n. sp.*—Fronde parva fusco-purpurea orbiculari profunde pluries divisa crassiuscula solidiuscula superne late foveolata papuloso-et fibroso-reticulata glandis magnis subclavatis obsita, laciniis angustis dichotomis supra planis (vel in siccis late canaliculatis) subtus carinato-incrassatis concoloribus esquamosis valde radiculosis radiculis intus lævibus, lobis sublinearibus apice valde obtusis anguste emarginatis subincrassatis intus tuberis magnis farctis (ut fronde valde vesciculosa videatur): fructu ignoto.

It is barely possible that this may prove to be the male plant of *R. Frostii.* It is distinguished by the purplish color of the very small frond, with large gland-like bodies on its surface, and large tuber-like bodies situated in its substance; also by the rootlets being entirely smooth within. There are no cavities in the frond excepting those containing the tuber-like bodies (or which have contained them at some former time). These bodies are solid and opaquish; they are turned brown by the action of iodine. The surface of the frond is broken up into broad shallow pits, with the shreds elevated and forming the gland-like bodies. These are fewer and much larger than in *R. Frostii*, which has the surface broken up into much smaller pits. The cavities containing the tuber-like bodies do not communicate with the pits in the surface.

3. **Metzgeria linearis.**—A *M. furcatæ* formis minoribus differt; fronde rigida magis regulariter furcatim divisa, laciniis magis æqualibus, reti minore confertiore magis ovali, cellulis longioribus crassioribus hyalinis interrupte marginata, ciliis marginalibus multo crassioribus vulgo spiniformibus, involucro masc. ratione majore, etc.

Jungermania linearis, Swartz, Prodr. Fl. Ind. Occ.: teste speciminis ex Herb. Hooker quod in Herb. Taylor asservatur (an originalis?).—*Metzgeria marginata*, Aust. MSS. 1874.—*M. furcata.* Hepaticæ Cubenses Wrightianæ, partim.

On trees growing over twigs and mosses, Cuba, *Dr. C. Wright.*

This species has much the general appearance of some of the smallish forms of *Riccia fluitans.* It is readily distinguished from its congeners by the margined subspinulose-ciliate or dentate frond. The ciliæ or teeth are in a single more or less interrupted row. The cellules of the marginal row are frequently like the others here and there, but they are mostly elongated and otherwise larger and more hyaline (much as in the leaves of some species of *Mnium* or *Fissidens*).

4. **Alicularia Lescurii,** *Aust. Hepat. Exsic. n.* 5.—Ab *A. Scalari* differt: foliis omnino emarginato-bilobis: fructus desunt.

On wet rocks, Tallulah Falls, Georgia, *Lesquereux.*

Leaves lobed much as in *Sarcoscyphus emarginatus*; but the areolation (lax) and amphigastria as in *Alicularia Scalaris.* Stems prostrate; these and the base of the leaves rather copiously radiculose underneath.

5. **Jungermania (Cephalozia) Kiæri,** *n. sp.*—Caule pertenui filiformi parce innovante ramoso, foliis latitudine caulem æquantibus magis minusve distantibus basi lata sessilibus subrotundis (magis latis quam longis) concavis subpatentibus, sinu lobisque obtusis et obtusiusculis bifidis, margine minute eroso-serrulata, cellulis minutis medialibus ovalibus marginalibus minoribus subquadratis, intercallaribus latiusculis, perianthio in ramuli perbrevi ventrali albescente oblongo-cylindrico subtriquetro profunde parce plicato apice obsolete denticulato, foliis involucralibus interioribus subserratis; amphigastriis nullis.

Africa; with *Dicranella Borgeni*, Hampe. Communicated by *Dr. Frank Kiær*, of Norway.

About the size of *J. divaricata*; but the leaves are shorter and broader in proportion, more patent, more concave, with the lobes shorter more obtuse and somewhat connivent, cells a little more distant, less quadrate, and less uniform, perianth on a much shorter branch, and albescent or very pale fuscous, etc.

6. **Calypogeia Sullivanti,** *n. sp. Aust. Hep. Exsic. n.* 74, *b.*—Caule prostrato flagellis ventralibus instructo siccitate dorso vulgo lenissime canaliculato $\frac{1}{2}$—$\frac{3}{4}$ unciali, foliis explanatis subcontiguis imbricatisve oblique rotundo ovatis subconvexis apice angustato

minute bidentatis, dentibus omnino rectis, sinu lunulato-obtuso, margine inferiori abrupte anguste decurrenti, reti satis laxo in magnitudine undique uniformi, amphigastriis minutissimis, superioribus orbiculatis bifidis, dentibus rectis acutiusculis integerrimis, sinu obtuso, medialibus inferioribusque bifurcate quadrilobis lobis primariis rotundo-quadratis valde divaricatis secundariis ovatis vel subulatis plerumque acutis ; colore satis viridi.

In the Southern States, *Sullivant*, *Ravenel*, *Mohr.* Also, on slides at the Delaware Water Gap, New Jersey (*Austin*).

C. bidentula, Nees, is a larger species with the leaves of a somewhat similar shape and areolation, but with the teeth at the apex much less uniform, often very obtuse. sometimes nearly obsolete; ventral flagella none.

C. arguta, N.&M., also has stems without ventral flagella, leaves of a much looser reticulation, broader at the apex, and furnished with larger, somewhat divergent teeth. Possibly our plant is the *C. Peruviana*, Nees (Syn. Hepat. p., 200).

7. **Lepidozia ? Californica,** *n. sp.*—Caule subfiliformi flaccido inordinate ramoso, foliis laxe imbricatis profunde palmatim 3-5-fidis, laciniis longe filiformi-attenuatis inæqualibus (inferioribus minoribus subinflexisque) integerrimis repandisve aut hic illic iterum incisis ; amphigastriis caule latioribus suboblongis profunde bifidis, laciniis longe inciso-ciliatis, foliis amphigastriisque involucralibus subconformibus ; reti laxo ; inflorescentia dioica ? pistillidiis numerosis, nudis : fructu—. (An *Mastigophoræ* species ?)

Bark of trees, mountains of California, *Bolander.* (Occurs in Musc. Exsic. Sulliv. & Lesqx. Ed. 2, with No. 474, Hypnum circinale).

8. **Radula Hallii,** *n. sp.* Statura inflorescentia habituque *R. complanatæ ;* sed foliis apice magis incurvis, involucralibus minoribus magis æqualiter bilobis, perianthio majore elliptico-oblongo subinflato apice angustiori ore sæpe subscarioso, perbelle distinguitur.

On trees, Salem, Oregon, *E. Hall.*

9. **Radula Sullivanti,** *Aust. Hep. Exsic. n.* 88^c—Flavescens subnitens ; caulibus strictis subparallelis imbricato-cæspitosis hic illic (præcipue ad apicem) confertim pinnatis, ramulis brevibus divaricatis, foliis subimbricatis flaccidis siccando subcrispatis patentissimis rotundo-ovalibus falcatis convexis apice magis minusve decurvis basi ventrali abrupte complicatis, margine subrepando-dentata inferiore rotundata et cum carina angulum plerumque rectangulum formante (carina ad $\frac{3}{5}$-erecta), lobulo parviusculo subinflato apice obtusissime triangulari-vel semicirculari-rotundato, margine interna cauli adnata et cum eo parallela, toro radicellarum magno umbonato vel subcampanulato, reti e cellulis mediocribus subobscuris punctiformibus subrotundo-hexagonis subuniformibus supra haud convexis, intercallaribus angustissimis pellucidis exstructo : flore et fructu ignotis.

On rocks ; mountains of Georgia, *Sullivant*, *Lesquereux.*

10. **Radula spicata,** *n. sp.*—Dioica, minutula ; caule brevi prostrato intricato valde innovanti-ramoso, foliis caulinis laxe imbricatis semiverticalibus subadscendentibus late obovatis obtusis integerrimis basi inflatis obtusissime complicatis spatio brevi latoque

bilobis, lobis utroque convexis (margine subincurvis), ventrali dimidio minore late triangulari-ovato obtuso margine interiori cauli adnato, toro radicellarum magno elongato subconico obtuso, reti e cellulis minutis subrotundo-hexangularibus conformibus supra vix convexis formato, foliis ramulinis minoribus basi magis inflatis lobulo ratione majore, involucralibus parvis, lobis æqualibus subovalibus, perianthio e basi obconica oblongo compresso apice subtruncato-rotundo e cellulis minutis hexangularibus confertis opacis formato, capsula oblonga, sporis magnis fuscis minute papillosis, granulis 1—4 magnis continentibus; spicula masculina 1—4 lineas longa arcte foliata, foliis perigonialibus 10—40 paribus, lobis æqualibus valde inflatis.

On trees; California, *Bolander.* Salem, Oregon, *Hall.*

Stems and perianth shorter than in *R. obconica*, Sulliv.; leaves of about the same size but of a different shape and texture; inflorescence different, &c.

11. **Lejeunia (Omphalanthus?) Mohrii,** *n. sp.*—Plantæ parvæ, sordido- vel fusco-virides; caule $\frac{1}{2}$—$\frac{3}{4}$ unciali tenui subsimplici, foliis subcontiguis oblique ovatis obtusis integerrimis (leniter repandisve) opacis valde chlorophyllosis patentissimis et subdecurvis (ut margine ventrali cum caule angulus rectus vel acutiusculus formetur) lobo parvo inflato apice unidentato, reti pro genere minuto obscuro, amphigastriis orbiculatis integris parvis (caule vix duplo latioribus) planis distantibus: fructu ——.

Mobile, Alabama, *Dr. Chas. Mohr.* (1874).

A small species, scarcely as large as *Lejeunia Sullivantiæ*, Aust., and having much the appearance of a *Radula.* Readily distinguished by the widely spreading or somewhat decurved leaves, of a small uniform opaque areolation, and by the small round entire amphigastria.

Lejeunia Jooriana, *n. sp.*—Plantæ minutæ pallido-virides; caule repente parce diviso laxe foliato, foliis ovatis obtusis planiusculis subpatentibus laxis, lobulo mediocri inflato unidentato, reti mediocri cellulis ovali-rotundis uniformibus supra convexis formato, perianthio minuto subobovato haud compresso apice leniter quinquangulato cæteroquin lævi: amphigastriis nullis.

On reeds; Louisiana, *Dr. Joor.*

Differs from *L. echinata*, Tayl., in the larger, more lax, less convex, scarcely papillose leaves, much less angled perianth, etc.

12. **Frullania Hallii,** *n. sp.*—Monoica, tetragyna; caule prostrato nordinate ramoso apice sæpe erecto flagellifero-attenuato defoliato atque amphigastriis crebris squarrosis instructo, ramis fructiferis brevibus clavatis adscendentibus, foliis parvis subdistantibus subimbricatisve oblique ovato-rotundis valde convexis apice incurvis, auricula magna vel majuscula galeiformi ovali-rotunda cauli contigua, lobulo interjecto dentiformi minuto, amphigastriis caule vix latioribus obovato-quadratis breviter bilobis utrinque subunidentatis-lobis subdivaricatis obtusiusculis, perianthio semi-exserto late obovato compressiusculo dorso versus apicem bi- ventre quadrinervoso unicarinato, involucri foliis uno alterove cum amphigastriis alte connatis repando-subdentatis, lobis fere æqualibus oblongis obtusis, ventrali extrorsum usque versus apicem unidentato, amphigastrio interiori late ovato rotundove apice integro nonnullove leniter emargin-

ato, margine integerrima vel obtuse dentata; spicula masculina rotunda; colore rufo-fusco.

On trees; Salem, Oregon, *E. Hall.*

Remarkable for the usually entire (at the apex) innermost involucral amphigastria. Frequently two or more capsules are successively matured in the same perianth. The species most nearly resembles *F. Bolanderi*, Aust.; but that is smaller and of a fuscous color, with shorter stems, more imbricated leaves and a much more compressed auricle, upper lobe of the involucral leaves broader, the lower one narrower and acute or acutish at the apex, innermost amphigastria of the involucre acutely 2 (–4) toothed at the apex, male spike ovate-oblong, &c.

Size and general habit about as in *F. inflata*, Gott, *F. Sullivanti*, Aust., and *F. Oakesiana*, Aust.; however, among other points of difference, none of these have entire involucral amphigastria; nor do any of them have the tooth on the margin of the involucral leaves situated above the middle of the lower lobe (as in both *F. Hallii* and *F. Bolanderi*).

13. **Rhossalanthus mnioides**, *nov. gen.* et *spec.* Lindb. in litt. Aug., 1874.—The above genus is founded upon specimens collected in Japan, by the N. Pac. Expl. Expd., under Com. Rodgers, and recently sent by me to Dr. Lindberg. He reports it as being a very distinct new genus, allied to *Scalia*, B. Gr. (*Haplomitrium*, Nees).—Stems erect (always?) about one inch high, rootless, flattish, and *aneura-like* but thick and solid. Leaves roundish, lax, decurrent, wavy, or contorted; the lower small, distant; the upper much larger and becoming crowded at the apex into a sort of cup-like involucre. Small, oval, naked antheridia (apparently tubers), are borne on the base of the innermost whorl of leaves on the inside; also occasionally in the axils of other of the upper leaves. Fruit not seen.

14. **Thallocarpus.** *Cryptocarpus, nov. gen.* Aust. in Proc. Phila. Acad. for Mar., 1869, p. 231.

Thallocarpus Curtisii. *Cryptocarpus Curtisii*, Aust. l. c.—According to Dr. Lindberg in a recent letter, there are amongst the *Chenopodiaceæ* a *Cryptocarpus*, H. B. K.; and among the *Musci* (*Orthotrichæ*) also a *Cryptocarpus*, D. M.; wherefore the above change. The plant evidently belongs, with Sphærocarpus (its nearest ally), to the Jungermaniaceæ.

§ 17. **Publications Received.**—1. *Notice biographique sur Charles-Frederic Meissner*, par M. Alph. de Candolle. Extrait du Bulletin de la Société botanique de France, November, 1874. Dr. Gray, in his notice of Meissner in the BULLETIN for June, 1874, says: "For the details of the life of this excellent botanist and estimable man we must wait until the tributes to his memory arrive, which his associates in his native Switzerland and in the chief centres of science in Europe are sure to offer." M. de Candolle makes these words of Dr. Gray the occasion of the present notice. Meissner (originally Meissner) was born at Berne, November 1st, 1800. He became Professor of Medicine in the University of Basle in 1828, but in 1830 changed the chair of medicine for that of botany, which he held till 1866, when infirmities obliged him to retire. M. de Candolle bears testimony to the conscientiousness of his work, and his untiring diligence." His manuscripts faithfully represented his manner of working. Regularity, order, finish in details were carried in them to a most unusual degree. The writing, always perfectly plain, read like print; a curious example of the harmony which is said often to exist between the manner of writing and the character of a person." Meissner was fond of music, of literature, and of friendly intercourse, and was of that kind and considerate character which the writer emphasizes by using the English word *gentleman*. A list of Meissner's writings is given, and an account of the fate of his library and herbarium. In reference to the transfer of the latter to Columbia College, the illustrious author gives a kindly hint to us: "The Torrey Botanical Club meet there; consequently the herbarium has fallen into good hands and will certainly be utilized.—2. *Zur Kentniss einiger Lycopodinen*, von F. Hegelmaier, Tübingen, July, 1874.—3. *Zur Entwicklungsgeschicte monykotyledoner Keime nebst Bermerkungen über die Bildung der Samendeckel*, von E. Hegelmaier. Mit Tafeln. From the Botanische Zeitung, Nos. 39—44, 1874.

§ 18. **Rhus versus Cypripedium.**—None of our Cypripediums are poisonous plants, applied either externally or internally. They are much employed by Eclectic Physicians of this country, and, though tons of these plants are annually brought to this market to be manufactured into Extract, Tincture, or "Cypropedin," I have yet to be informed of the first case of poisoning, the result of handling the fresh plant or otherwise.

I am very susceptible to the effects of Rhus, even from contact of the stems in winter or when quite dry. Others are liable to be poisoned from the emanations of the plant at long distances without coming into contact with it. Some others still have a periodical return of the symptoms of such poisoning recurring for a number of years thereafter.
R. E. Kunze, M.D.

[We have, ourselves, known cases of the periodical return of the Rhus irritation in persons who had handled the plant when brought into the city, but who avoided doing so a second time, and were not likely to go where it grew.—Eds.]

§ 19. **Errata.**—p. 15, l. 5, for "sub-order" read "sub-genus": l. 6, for *Chanactis* read *Chænactis*. In the list of Mr. Paine's Palestine plants, *Habenaria tridentata*, Scopoli, should doubtless read *Orchis tridentata*, Scopoli. As regards the missing pages we intend to supply them hereafter.

§ 20. A MARCH RAMBLE.

Let us search the brown woods ere the March winds are laid,
Ere the flower-buds swell, and the leaves cast a shade.
To the lover of nature they ever display
Such treasures as well for the seeking repay;
And now, though so dreary and lifeless they seem,
We shall find that with myriad beauties they teem.
Where the shadows lie deepest, the frost lingers yet,
And out to the meadows he steals at sunset;
But sooner each morn the sun puts him to flight,
And quickly unbinds what he bound in the night.
On north hill-sides the ice-bearded cliffs are yet dripping,
And sunbeams from lingering snow-banks are sipping.

Each effort of summer the winter withstands,
And checks every bud that too early expands.
It would seem the most desolate time of the year,
If we knew not that nature's new birth were so near.
A few pendant leaves rustle withered and sere,
Only making the forest more death-like appear.
Overhead, 'mongst the whispering branches are heard
Æolian melodies, mournful and weird.
And swaying and creaking, the lonely trees seem
To be mourning the loss of their leafage so green,
Which the sullen old year with his autumn blasts beat
From their branches and downward cast dead at their feet.
Yet, though robbed of their summer adornments, how grand
In their massive proportions the forest trées stand!
Moored deep in the earth, still erect are their forms,
Though against them have beaten a thousand wild storms.
And the ponderous arches of nature's own shrine
Spring upward with never a keystone to bind,
Supporting, it seems, the blue dome overhead,
Against which the branchlets like tracery spread.
But our minds need not dwell on such fancies alone,
When around us in wildest profusion are strewn
The treasures of nature, more wondrously wrought
Than those that 'neath Ormus' dark waters are sought;
More marvellous beauty lies hidden in them
Than men toil to unprison from India's rough gem.
Their cost is the seeking, a glance of the eye
On the shadowy sides of the tree trunks close by,
Which dial each sunshiny hour on the ground;
And where point the shadows, there too, are they found;
On yonder gray rocks, on all things that decay,
The mosses and lichens their beauties display.
And the fungi, so queer and fantastic, are seen
In every shape, of all colors but green.
Here, springing from stumps old and rotting, are shelves,
Brown, scarlet, or white, as if built by the elves;
There cushions and stools are strewn over the ground,
And puff-balls and earth-stars are scattered around.
Some like nests filled with eggs, or like vases appear,
And others like corals or antlers of deer,
Fallen branches and leaves it delights them to deck
With curious patterns, perhaps a mere speck,
Or broad-spreading wart of the cankerous Sphæria,
Or a velvety carpet unrolled by the Steria—
Most delicate lace-work—or Irpex's frill,
To imitate which would defy human skill.
The recluses of nature, they love best to dwell
In the dark and damp woods, like the monk in his cell.
The mosses and lichens, too, love the damp shade,
And the wet, frosty season, when other plants fade.
All shrivelled and crisp through the summer they lie,
As if dead, while the gay, floral train passes by;
But when touched by the autumn's white crystalline dew

Which blights their proud rivals, again they renew
Their mysterious growth, which so little men heed,
And again, in a way of their own, bloom and seed.
What tree or what herb, be it ever so fair,
Can in exquisite grace with the mosses compare?
The feathery Hypnums rich tapestries spread
And many-hued mats, soft as down to the tread.
Wide o'er cold bogs spreads the pallid peat moss;
Fontinalis' green tresses the mountain-streams toss;
The emerald Bryum on moist, shady banks
Unfolds its rosettes, and here, too, in close ranks,
The troops of Dicranum are tilting their lances,
And the Liliput fruit of Bartramia dances
In each passing breeze: all these tiny green spheres
Are caskets of moss-seed—mere dust it appears,
But all vital with life—but as yet it is hid
By a cunningly fitted, and bossed little lid;
While above this a veil, too transparent to hide,
Rests lightly, as over the head of a bride.
But in quaintness of structure, the lichens outvie
All else that in nature rejoices the eye—
All sober in color, but varied in form,
From the Graphis, whose tracings the tree-trunks adorn,
As with Arabic writing or outlines of maps,
To the ugly rock-tripe that on yonder cliff flaps.
From old branches the pendent gray Usnea sways,
While upon them the graceful Parmelia displays
Its parterres with curved paths, which the pixies might tread,
And gay little seed-beds, brown, orange, and red.
And here, on this knoll, which the wind has swept clean,
The Cladonia's whimsical structures are seen.
One resembles a balconied minaret tall,
Or a ruined old castle just ready to fall;
And another seems most, with its flame-colored tip,
Like a beacon-fire such as the old Normans lit.
And those that like delicate corals appear
Are the favorite food of the Arctic reindeer.
But the daylight is fading, the sunbeams slant low,
And fainter and fainter the long shadows grow.
Beneath the horizon the sun sinks from view,
And let us, with him, to the scene bid adieu,
And leave buried in shade through the sombre night hours
The murmuring forest and all it embowers.

ALLEN H. CURTISS.

Liberty, Bedford County, Va.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College at 7½ P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 21. Notes on the Anthocerotaceæ of North America, with Descriptions of Several New Species, by C. F. AUSTIN.

[Names preceded by an asterisk (*) are provisional; being introduced, along with the others, for the purpose of calling the attention of collectors more directly to this most obscure family of Hepaticæ; in the hope that it may lead to the collecting of more and generally better specimens; since it is absolutely impossible to come to any satisfactory conclusion concerning the species and forms that exist in this country, with the small amount of material now on hand.]

ANTHOCEROTACEÆ, Lindb. in litt.

Anthoceroteæ, Nees.

Capsule dorsal, pod-like, mostly erect and bivalved, usually with stomata in its outer wall, with a filiform columella, tapering into a pedicel or often sessile, with a bulbous base. Involucre tubular. Perianth none. Calyptra rupturing early near the base and carried up on the apex of the capsule, crowned with a subsessile stigma. Spores flattish, more or less convexo-prismatic, either papillose or smooth. Elaters present, with or without fibres. Vegetation frondose; texture flaccid and more or less vesicculose. Epidermis and pores none.

The family comprises three genera*; viz., Dendroceros, Blandovia and Anthoceros. So far as is known only the last one named occurs within our limits. The other two are tropical; however, Dendroceros may be looked for in the States bordering on the Gulf of Mexico.

ANTHOCEROS, Linn.

Fronds dark green or blackish, usually depressed, variously lobed and divided, of a peculiar lax and vesiculose texture, with a large green grain (chlorophyl) in each cell, and often with small blackish tubers or gemmæ in its substance, frequently glandularly thickened at the apex of the lobes, or in streaks along their middle (in the latter case the fronds are falsely nerved). Capsule linear or cylindrico-oblong, 2-valved. Spores papillose or smooth, colored. Elaters in our species simple or branched, often geniculate, more or less heteromorphous, either destitute of fibres, or very imperfectly and obscurely fibrillose; (in some foreign species furnished with a single broad spiral band.

§ *Spores yellow: elaters usually also yellow, or with a yellowish tinge.*

1. **Anthoceros lævis**, Linn.—Frond smooth and nearly plane above. Involucre 1—2 lines high, trumpet-shaped when dry, the mouth repand-toothed, often thickened, rarely scarious. Capsule pale brown or yellowish, 1—1½ inches high; the valves often much twisted in drying. Spores rather small, nearly smooth, flattish, angular. Elaters yellowish, slender, variable in length, but always rather short, geniculate, flattish, often branched and somewhat articulated.—*A. flexivalvis*, L. & Lg.

Var. major, Aust. Hepat. Exsic. n. 123^b.—*A. Carolinianus*, *Mx.*—

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* **Notothylas**, *Sulliv.*, comprises a few species which have all the essential characters of Anthoceros, but some of them in a reduced degree. The characters upon which the genus is founded appear to be wholly *gradal*. It may possibly rank as a sub-genus, provided a distinct line of division can be drawn between it and Anthoceros proper.

A. Carolinianus and *A. laciniatus*, Schweinitz. Differs chiefly in being larger in all its parts.

Canada to the Gulf of Mexico and California; the var. in the South and in California.

2. * **Anthoceros cæspiticius**, De Not. (Syn., Hep. p. 588.)—*A. tuberosus*, Tayl. (Syn. Hep., p. 791. *A. Torreyi*, Aust. MSS.—Frond dissected to the base, the divisions narrow and variously lobed, expanded at the apex, very dark green, more or less glandular, nerved or nerveless, 2—4 lines long; sending down here and there from the nerve underneath, or from its apex, a radiculose flagellum, which terminates in a roundish tuber-like turion. Involucre broad, scarcely a line high, broadly sulcate and obtusely biangled on the back, minutely punctate; the apex sub-truncate, repand-tridentate and narrowly scarious at the mouth. Capsule thick, 5—7 lines long, sessile, sulcate or angled, the apex obtuse and subtruncate. Spores as in *A. lævis;* elaters longer than in that species. Columella thickish, fibrillose.

The above description is taken from a specimen in Herb. Torrey. under the name of "A. lævis, Linn.," from the Island of Corsica. But sterile fronds of the same character have frequently come to my notice, mixed with terrestrial mosses from Texas and California.

3 **Anthoceros Hallii**, *n. sp.*—Fronde ½—1 unciam longa ½—1 lineam lata cæspitosa sæpe erecta lineari vel elongato-flabelliformi, apice integro parceve lobato sæpissime glanduloso-incrassato, involucro terminali (semper?) pellucido pallido-viridi 1—1½ lin. longo, apice truncato tenui integro; capsula (immatura) circa 3 lin. longa brevi pedicellata sulcata, textura crassa molli; sporis lævibus; elateribus fere ut in *A. lævi.*

Fertile plant on the ground, Silverton; sterile on dripping rocks, Salem, Oregon, *E. Hall.* Also in swamps, Marvin County, California, Bolander.

Frond albescent or ochraceous below, pale green above, or the glandularly thickened portion very dark green, composed of several thicknesses of cells; the outer layer smallish, close and quadrate, the inner layers elongated and lax. Involucre terminating the frond, and a continuation of the outer layer of cells. Gemmæ very large, fusiform. Capsule very narrow; the valves remarkably thick. Pedicel very short.

The California specimens have the fronds prostrate and entangled, irregularly dissected, plicate-costate or lamellate; the lamellae bearing elliptical tubers underneath.

4.* **Anthoceros Oreganus**, *n. sp.*—Fronde tenui hic illic glanduloso incrassata, involucro perbrevi supra medium abrupte constricto et scarioso ore subtruncato leniter repando-lobato inferne inflato minute et confertim punctato, capsula sessili (basi bulbiformi) crassiuscula circa 6 lin. longa valvulis apice cohærentibus; sporis (parvis flavidis indistincte granulosis) et elateribus fere ut in *A. lævi.*

Oregon, *E. Hall.*

Capsule splitting to the mouth of the involucre. Involucre often not scarious at the mouth. A small species.

5. **Anthoceros sulcatus,** Aust.—(*Notothylas Hallii*, Aust., *MSS.*, 1874), *n. sp.*—Fronde cæspitosa erecta basi attenuata flabelliformi 2—3 lineas longa saturate viridi, margine varie lobata et repanda, involucro circa ½ lin. longo obovato-quadrato scabriusculo, ore repando-dentato, capsula 2—2½ lin. longa tenui erecta vel curviuscula sulcata fere sessili compresso-quadrangulari, textura crassa molli, collumella crassiuscula fibrosa, sporis majusculis flavidis, elateribus brevibus.

On moist earth, Salem, Oregon, *E. Hall.*

This species is evidently a connecting link between Notothylas, Sulliv., and Anthoceros.

Frond apparently hollow, with a few large black tuber-like gemmæ in its substance; the apex occasionally descending and bearing a roundish tuber, the green granules in the cells larger than in *A. orbicularis*; rootlets fascicled, granulose. Involucre from the apex of the frond. Capsules (very numerous) acutely angled when dry, narrow, yellow, compressed, striate-angled, of a thick but lax texture. Pedicel very short. Spores larger and not so smooth, and elaters paler, otherwise they are much as in *A orbicularis.* In the young state the fronds appear to be prostrate.

6. **Anthoceros (Notothylas) orbicularis.**—*Carpobolus orbicularis*, Schweinitz.—*Notothylas orbicularis* and *N. valvata*, Sulliv.—General appearance of the frond and spores much as in *A. lævis.* Elaters very minute, pale, nearly or quite as broad as long, very thin. Capsules more or less curved, 1—2 lines long, erect or decumbent and wholly included in the involucre or partially exserted in the same specimen, marked with a suture on each side, but often the valves do not separate spontaneously, of a thin and rather lax texture. Antheridia large, usually single immersed in cavities in the frond which have the margin slightly elevated. The fertile involucre remains closed at the apex when the capsule is included; but usually as the latter increases in size, the former becomes irregularly torn.

Canada to the Gulf of Mexico.

§ § *Spores black: elaters fuscous.*

7. **Anthoceros punctatus,** Linn.—Fronds small, depressed, or often cæspitose and erectish, of a lax texture, more or less glandular, and often falsely nerved. Involucre rather shorter than in *A. lævis*, oblong-linear, slightly repand and sometimes scarious at the mouth. Capsule about one inch high, black. Spores smallish, strongly muriculate, sharply angled. Elaters rather short and broad, flattish, geniculate and variously contorted, somewhat articulated.

Var. scariosus, (A. scariosus, Aust. olim), has the frond and involucre lamellated, and the latter broadly scarious at the mouth.—Var. Ohionesis. Frond distinctly nerved; apex of the lobes much thickened and solid.—Var. Eatoni. Fronds cæspitose and erect, crowded; involucre narrower, more or less lamellated, parallel to and more or less connate with the surface of the frond.

Canada to the Gulf of Mexico and West to Missouri.—Var. 1 in S. Car., *Ravenel.* Var 2 in Ohio, *Lesquereux.* Var. 3 in Florida, *Eaton.*

8. **Anthoceros fusiformis,** *n. sp.*, Aust. MSS., 1866.—Differt ab *A.* punctato: statura majore, fronde magis dissecta, involucro multum altiori (2—4 lin.) subfusiformi, capsula longiori (1—2 unc.) solidiori, sporis minutius papillosis, elateribus longioribus angustioribus magis opacis solidioribus.

Observation Inlet, Columbia, *Dr. Scouler* in Herb. Torrey; also in the Herb. Taylor. California, *Bolander.* Oregon, *E. Hall.*

9. **Anthoceros stomatifer,** *n. sp.*—Differt ab *A punctato*, fronde solidiori (reti minori) margine glanduloso-cristata, involucro longiori angustiori ex margine frondis orienti solidiori, capsula longiori graciliori stomatifera, sporis paulum majoribus magis papillosis intensius atris.

Oregon, *E. Hall.*

Fronds small, black, opaque, glanduliferous. Capsule with the long and slender valves much twisted in drying, and bearing numerous stomata in its walls.

10. **Anthoceros Ravenelii,** *n. sp.*—Fronde parva pallida tenui sublævi e cellulis parviusculis subpellucidis (granulis viridibus impletis) formata, laciniis brevibus varie repandis lobatisve, involucro brevi (circa $\frac{3}{4}$ lin. longo) late cylindrico truncato ore anguste scarioso, capsula (vix matura) sessili circa $\frac{1}{2}$—$\frac{3}{4}$ unc. longa bivalva, columella crassiuscula filamentis squarrosis obsita, sporis magnis pallido-fuscis plano-convexis in circuitu rotundis minutissime granulosis obscure angularibus, elateribus minutis opacis granulosis subtriangulari-prismaticis difformibus subæque latis ac longis pallido-ochraceis.

Moist earth, South Carolina, *Ravenel in Herb. Sulliv.* Anthoceros

Notothylas This species is also evidently a connecting link between ~~this~~ and the ~~following genus~~. It is well marked by the pale color of the frond, by the large (immature) spores and by the minute subprismatic angular granulose elaters.

Columella with long jagged squarrose filaments attached to its surface, among which the elaters and spores are entangled. Cells of the frond smaller than in *A. punctatus,* the frond being more closely areolated. Involucre of a lax hyaline texture, (punctate like the frond); the cells at its base oblong, near the apex rhombic, at the mouth somewhat transversely elongated.

11. **Anthoceros Lescurii,** *n. sp.*—Fronde nigra circa $\frac{1}{2}$ unc. longa e basi valde angustata late flabelliformi crassa opaca supra valde rugosa et lamellosa confertim papulosa planiuscula, margine crenato-cristata, involucro $\frac{1}{4}$ ad $\frac{3}{4}$ lin. longo, basi valde dilatato, apice subtruncato, ore subdilatato subincrassato leniter lobato, textura carnosa et crassa, capsula $\frac{1}{4}$ ad $\frac{3}{4}$ unc. longa crassiuscula stomatifera pedicello brevissimo inclusa, sporis aterrimis magnis plano-convexis in circuitu subrotundis (obscure angularibus) distincte papillosis, elateribus brevioribus quam in *A. punctato* cæteroquin fere similibus.

"Anthoceros lævis, Var. Carolinianus, Michx. New Orleans." *Herb. Lesquereux.*

Remarkable for the thick, opaque rugose lamellated, broadly flabelliform black frond; for the much expanded base of the very short involucre, for the large black papillose spores, and for the very short elaters.

There are mixed with and adhering more or less to the spores and elaters, a great many short geniculate slender pale jagged filaments. These are, doubtless, of the same nature as the filaments which adhere to the columella in some species (*e. g., A. Ravenelii*). Probably they are the remains of the effete *cellules matricales.*

12. **Anthoceros Olneyi,** *n. sp.*—Fronde erecta sub prostratave suboblongo-flabelliformi varie lobata crenatave substriato-venosa opaca supra ob granulas magnas tuberculatas sub epidermide elevato-punctata (ut verruculosa videatur), involucro late cylindrico circa lineam longo leniter striato haud punctato e cellulis parvis ovali-hexagonis formato, apice truncato, ore crenato repando-dentatove subscarioso, capsulis (vix maturis) $\frac{1}{4}$ — $\frac{3}{4}$ unc. longis erectis, sporis nigris magnis plano-convexis in circuitu rotundis opacis minutissime papilloso-granulosis, elateribus valde compressis catenulato-articulatis (sine fibra spirali).

Florida, *Dr. Chapman ;* communicated by *Stephen T. Olney, Esq.*

Remarkable for the large black globular tuberculated granules just beneath the surface of the frond, which give it a strikingly warted appearance, for the large minutely papillose spores, and for the short-jointed flat elaters. About the size of small forms of *A. punctatus;* from which it is readily distinguished by the different texture of both the frond and involucre, as well as by the much larger neither angled nor muriculate spores, and by the jointed elaters. The joints of the elaters are nearly or quite as broad as long, very flat, roundish (variable in shape and size) and placed end to end or often here and there two of them side by side. The fronds are (in my specimen) cæspitose and mostly erect. The granules under the epidermis are easily separated from the frond by maceration. (*A. glandulosus*, L & Lg., has somewhat similar granules in the upper surface of the frond, but they are much smaller, not so exactly globose, and of a pale color.)

* 13. **Anthoceros Joorii,** *n. sp.* ?—Size of the plant about as in the three last described species; in texture intermediate between the first two of them. Spores and elaters much as in *A. Lescurii*, but there are no jagged filaments mixed with them as in that species, nor is the columella fibrillose as in *A. Ravenelii.* However, I am inclined to believe it will prove to be a more mature state of the last-named species.

Louisiana, *Dr. Joor.*

14. **Anthoceros (Notothylas) melanosporus,** *Sulliv.*—General appearance and texture of the frond much as in *A. punctatus.* Spores fuscous, smooth. Capsule, elaters, size and shape of spores about as in *A. orbicularis.*

§ 22. Notes on the Genus Pellia, by C F. Austin.

Pellia porphyrorrhiza, (Nees) Aust.—*Pellia phylloloba*, Aust. MSS.—*Jungermannia porphyrorrhiza*, Nees in Mart. Fl. Brazil, I., p. 343.—*Noteroclada confluens*, Tayl. Hepat. Antarct. in Lond. Jour.

of Botany for 1844, p. 478.—*Androcryphia porphyrorrhiza*, Nees. Synop. Hepat., p. 470.

This plant stands erroneously described in the works referred to above. By the inflorescence, fructification, texture of the frond, mode of growth, rootlets, etc., it is a true Pellia.

Involucre usually a little longer than in P. epiphylla, otherwise very similar. Calyptra included, about equalling the involucre, bearing abortive pistillidia on its (otherwise smooth) surface. Pedicel 1—2 inches high. Capsule pale, globose, 4-valved. Spores large. Elaters very slender, long and tortuous bi (—tri ?)-spiral. Antheridia solitary, enclosed in ovate-lageniform sessile involucres, (which Nees appears to have mistaken for pistillidia), not biseriate (as affirmed by Taylor). Lobes of the frond almost always distinct and leaf-like, roundish (rarely if ever oblong). Purple tinge of the rootlets (from which the plant takes its specific name) much less decided than I have usually found it in *P. epiphylla.* Apex of the surculi often descending and producing a turion, (as in various other of the frondose Hepaticæ). Although antheridia and pistillidia occur in the same cæspites, I have not seen them on the same frond. The midnerve is narrower and thinner than in *P. epiphylla ;* and I have not been able to detect anything similar to the network of colored fibres, which sometimes occurs in that species; otherwise the texture in the two species is similar. Fronds from 1—2 inches long, by 2—4 lines broad; the lobes roundish and leaf-like, succu~~l~~ous. b /

Pellia epiphylla, (Linn.), Nees. In this species the involucre is often reduced to a mere flap, covering the fruit-bearing cavity. Calyptra always distinctly tuberculated.

I once supposed that I had discovered pores in the upper surface of the frond in this species; but this is most likely an illusion. They are probably the ends of the anastomising fibres of the peculiar network, which often exists throughout the middle of the frond, showing through the superimposed layer of hyaline cells. This network resembles a series of parallel, vertical, and transverse perforated screens. When furnished with this peculiar network, the frond is always transversely rugulose.

Pellia calycina, Tayl., occurs on wet limestone and slate rocks in this country, as well as in Europe. It is readily distinguished by the ciliate-fringed or lacerate mouth of the involucre, and by the smooth included calyptra. *P. fu~~s~~iformis*, Nees, is most likely only a water form of this species. c /

§ 23 **New Fungi**.—By E. C. Howe, Yonkers, N. Y.—No. *IV*.

1. **Diderma albulum**, *n. sp.*—Peridia crowded, whitish, oblong or obovate-oblong; inner peridium ash-gray; flocci white, lacunose, bearing brown spores, black in the mass; pedicels short, flat, arising from the membranous hypothallus, not hyaline; columella none.

On bark and wood of *Ailanthus.* The compact peridia are usually distinct; and to the naked eye, of a lead-white color.

2. **Didymium simulans**, *n. sp.*—Peridia gregarious or scattered, small, white, subglobose or irregular, broadly umbilicate beneath; flocci white, bearing light brown spores, black in the mass—

purplish under a lens; stems straw-colored, twisted, tapering upwards; columella none.

On bark and wood of *Ailanthus.* The peridia are sometimes very irregular and occasionally subsessile. The outer coat is white, thin, and closely adheres to the smooth, delicate internal peridium.

3. **Hypoxylon smilacicola,** *n. sp.*—Small, black, roundish or elliptical, irregular when confluent, pulvinate; perithecia subglobose; asci cylindrical or subclavate; spores brown; sub-cymbiform, .0006′—.0008′ in long and .0003′ wide, usually with several nuclei.

On dead stems of *Smilax.* The spores are rarely elliptical atmaturity, but sometimes pointed at both extremities.

§ 24. New Fungi, by W. R. Gerard.—No. V.

Uromyces Pontederiæ, *Gerard.*—Hypophyllous, scattered, often following the nerves, sori small, at first covered with the somewhat bullate cuticle, then irregularly ruptured, snuff-brown; pseudo, spores oblong or ovate, on very short pedicels, apex with a small hyaline spot, scarcely papillate.

On leaves of *Pontederia cordata,* Poughkeepsie, N. Y.

Peziza griseo-rosea, *Gerard.*—Sessile, cups fleshy, rather thin, hemispherical, then expanded, externally greyish-ochre, rather mealy; disc pale rosy, becoming pale brownish (1—1½ in. broad); asci cylindrical; sporidia elliptical, rough (.015—.018 × .0075 —.01 *mm.* or .0006′—.0007′ × .0003′—.0004′). Paraphyses linear scarcely incrassated.

On ligneous earth in woods. Poughkeepsie, N. Y.

Helotium pullatum, *Gerard.*—Gregarious, dark dingy ochre when fresh, becoming darker and fuliginous when dry; at first clavate, then somewhat obconical, externally darker; stem short, expanding into the cup; disc plane, concave when dry, immarginate (1—2 *mm.* broad); asci cylindrical, narrow; sporidia linear, obtuse 2—4 nucleate, at length pseudo-septate (.018—.02 × .004*m.m.*) yellowish.

On stems of *Vitis,* in damp places. Poughkeepsie, N. Y.

Microsphæria Van Bruntiana, *Gerard.*—Amphigenous; mycelium dense, white, persistent; conceptacles globose, scattered or gregarious; appendages 12—15; about equal in length to diameter of conceptacles, several times dichotomous, truncate at their apices; sporangia —— ? Containing eight spores.

On leaves of *Sambucus Canadensis.* The structure of the appendages is very different from that of any other species with which we are acquainted. Poughkeepsie, N. Y.

Peziza (*Humaria*) **Gerardi,** *Cooke.*—Violaceous, sessile, fleshy. Cups hemispherical, then flattened, externally greyish-violet; disc dark violet (2 lines broad); asci, cylindrical (.23 *mm.* long); sporidia fusiform, with a central nucleus (.032—.035 × .008 — .009 *mm.*, or .0011′ × .0003′). Paraphyses filiform, clavate at the tips.

On damp earth, bordering a stream; July. Poughkeepsie, N. Y.

Peziza (*Fibrina*) **Cedrina,** *Cooke and Gerard.*—Scattered, pitch-brown; externally, fibroso-ragose, cups globose, soon open and cup-shaped, margin contracted; disc slightly paler; asci cylindrical; sporidia oval or elliptical, with two nuclei (.02 × .01 *m m.* or .0006′ × .0003′). Paraphyses profuse, clavate, slightly curved at the tips.

On dead branches of *Juniperus Virginiana.* New Paltz Landing, N. Y.

Peziza (*Mallisia*) **pulviscula,** *Cooke.*—Gregarious, very minute, like grains of sugar, soft, almost tremelloid. Cups globose, then expanded, smooth, pallid, watery yellowish white (0.4 *mm.* broad) diaphanous, asci cylindrical; sporidia exceedingly minute; spermatioid (.0002′ long).

On dead stems of *Phytolacca.* Poughkeepsie, N. Y.

Uromyces Arisæmæ, *Cooke.*—(*Uredo Ari-Virginici, Schw.,*) in part.)—Amphigenous, spots indefinite, scarcely discolored, sori gregarious, sometimes in broken circles or circinate, small, for some time covered with the bullate cuticle, then irregularly ruptured; pseudo-spores obovate, on very short pedicels, ferruginous, with a slight hyaline papilla at the apex.

On leaves of *Arisæma.* Poughkeepsie, N. Y. The spots on which the sori are arranged retain the bright green hue of the living leaf even after it has been for a long time dried.

Peziza chrysophthalma, *Ger.*, in Bull. Torrey Club, iv., p. 48, is *P. convexula, Persoon.*

Peziza nigropunctula, *Gerard.* in Bull. Torrey Club, v., p. 40, is *P. compressa,* Tul.

For a correct determination of the above (with a single exception) I am indebted to Dr. M. C. Cooke, through whose hands they have passed by duplicate.

§ 25. **Onoclea sensibilis.**—What is the origin of the specific name of this fern? Without knowing the authorities, I have commonly supposed the name to be derived from its sensitiveness to frost; but in a book of considerable note, "*Conversations on Botany,*" 4th Ed., London, Longman, Hurst, Rees, Orme and Brown, 1823, on pp. 222, 223, I find the statement:

"There is one species found in North America, called the sensi-
" tive fern, Onoclea sensibilis, which is said to wither immediately
" on being touched by the human hand, but to endure the touch of
" other bodies without being at all injured.

"Sprengel, a German botanist, who wished to prove the truth of
" this curious circumstance, asserts that he repeated the experiment
" several times, and always with the same effect."

I question whether the experience of any American botanist will confirm this alleged assertion of Sprengel. I. H. H.

In Rees' Cyclopædia we read, that the barren fronds are "smooth and of a thin texture, so delicate that, as we have heard, the frond soon fades after being drawn through the hand while growing, which Morison also relates on the authority of Simon Paulli."

Our native plants are not usually of "thin texture" and great "delicacy," nor have we ever been able to see the propriety of the name.—[Eds.]

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§ 26. New or Little-known Ferns of the United States.—No. 3.

7. **Cheilanthes myriophylla**, Desv.—A well-known Mexican and South American Fern, but very rare in the United States. It much resembles *Ch. Fendleri*, Hook, but is rather larger, and has the under surface matted with a fine tomentum under the scales, while C. Fendleri has the scales only, and these mostly confined to the midribs and divisions of the rachis. It was collected several years ago in "South California" by Dr. Arthur Schott, in Arizona in 1866 by Mr. Clarence King, and in the same territory in 1870 by Dr. E. Palmer.

8. **Cheilanthes Clevelandii**, sp. nov.—Fronds (4–10 inches high) ovate-oblong, tripinnate with closely set minute roundish segments, smooth above, beneath densely covered with minute imbricating, cinnamon-brown, ovate, ciliated and laciniated scales, growing on the segments as well as on the midribs; segments flattish, the margin narrowly recurved and unchanged in texture.—Growing on a mountain about forty miles from San Diego, California, at an elevation of about 2,500 feet, Mr. Daniel Cleveland. While closely related to *C. myriophylla* and *C. Fendleri* this Fern is easily distinguished by the deep fulvous color of the scales, which are elegantly ciliated, the cilia recurved and visible from the upper surface of the frond. The rootstock is apparently rather short, and scaly as in the related species. The stipes from two to six inches long, dark brown, and, like the rachis, beset with narrow rigid scales.

9. **Cheilanthes Cooperæ**, sp. nov.—Fronds (4—8 inches high) ovate-lanceolate, hairy, like the brownish fragile stipes, with entangled or straightish, nearly white, articulated, *mostly gland-tipped* hairs, twice pinnate; the rather distant pinnæ oblong-ovate, pinnules roundish-ovate, crenate and incised, the ends of the lobules reflexed and forming herbaceous involucres, segments at length flat. —California; near Santa Barbara, Mrs. Ellwood Cooper; Sierra Valley, Mr. J. G. Lemmon—This has much the appearance of the Eastern *C. vestita*, which ranges from New York to Kansas, but has never been found west of the Rocky Mountains. In C. vestita the hairs are always very acute, while in C. Cooperæ they are usually tipped with glandular and, I think, viscid enlargement. I take great pleasure in giving for the first time to an American Fern the name of a lady botanist.

10. **Cheilanthes microphylla**, Swartz.—This species was collected by the Botanists of the Mexican Boundary Survey, many years ago, together with *C. Alabamensis*, Kze. The latter has just been sent again from Austin, Texas, but the former has not been received a second time from anywhere within our limits.

D. C. EATON.

NEW HAVEN, *May* 15th, 1875.

§ 27. Description of two new species of Musci, by THOMAS P. JAMES.

1. **Atrichum Lescurii**, *n. sp.*—Plantæ gregariæ vel laxe cæspitosæ, fusco-nigricantes. Caulis simplex ultra pollicaris, erecto-flex-

uosus, gracilis inferne nudus, superne laxe foliosus. Folia caulina perichætaliaque siccitate crispato-inflexa, humiditate erecto patentia, lineari-lanceolata acuminata, concava margine argute serrata, basi dilatata subamplectente ciliata, cellulis subquadratis superne rotundatis obscuris areolata; costa percurrente lamellis serratis 4–8 dorso convexo. Capsula in pedicello brevi vix semipollicari crassiusculo recto ovato-cylindrica brevis vel ore dilatato turbinata.

Patria Alaska, A. Kellogg legit.

A very interesting slender dark colored species, quite distinct, with narrow crisped leaves, and 6 to 8 long flexuose cilia on each margin near the sheathing base, the lamellæ of the costa serrate. The capsule is very short ovate with a wide mouth; the peristome and operculum wanting, a loose calyptra of the genus was found. The plant was intermingled with a variety of Pogonatum contortum.

2. **Dicranodontium nitidum,** *n. sp.*—Laxe cæspitosum. cæspites molles, inferne pallide rufescentes, superne pallide viridi sericei. Plantæ graciles, simplices vel superne parce divisæ sola basi radicantes. Folia inferiora minora e basi lanceolata brevi subulata superiora e basi ovali-oblonga multo longiora in subulam longam crassam caniculatam denticulatam, dorso rugosam exeuntia, costa dilatata mediam partem basis occupante subulam que totam efformante. Anguli basilares concavi eorundem reti hexagono-quadrati, pellucidi, superiores angusti equilaterales longiores.

Hab. on rocks at Dixville Notch, New Hampshire, *James.*

This new species well characterized by its reticulation, its strong broad nerve which fills the whole point from its base, and by the long rugose or papillose point denticulate on the back and dentate on the border. The leaves are generally somewhat falcate curved or secund at the base of the stems, erect open or even falcate and undulate at the top of the plants when moistened. The point of the leaves is not quite as long as that of Dicranodontium longirostre, but the nerve is thicker, broader, occupying the whole point and nearly one half of the base of the leaves. The whole plant presents a beautiful shining lustre.

§ 28. **Publications Received.**—*A Sketch of the Natural History of the Diatomaceæ*, by A. Mead Edwards, M. D., Microscopist to the Geological Survey of New Hampshire, pp. 416–505. Concord, N. H., 1874. This is a separate issue of a chapter of the State survey. It is a disputed point whether the Diatomaceæ belong to the vegetable kingdom; our author inclines with Haeckel to separate them under the name of Protista. They are, however, usually considered as vegetables, and as such come under the botanist's observation. This sketch is intended as a popular introduction to the study while scientifically correct. It consists of eight parts; relating to the general character, movements, modes of growth and reproduction, modes of occurrence, geological relations, and directions for collecting and studying. There are three Albert-type plates from the author's own drawings. The remarks on the occurrence of Diatoms in guano and the sedimentary deposits of the Western basins and canons are of general interest. The author has a few copies to dispose of at $4 apiece. His address is 120 Belleville Avenue, Newark, N. J.—2. *Botanical Contributions*, by Asa Gray, from Proc. Am. Acad. Arts & Sci., Vol. X., April, 1875. Conspectus of the North American Hydrophyllaceæ. We notice that Ellisia ambigua, Nutt., is now decided to be a slender form of E. Nyctelea, L.—3. *Contributions to American Botany, V.*, by Sereno Watson, from Proc. Am. Acad. Arts & Sci., Vol. X., April, 1875. Revision of the Genus Ceanothus, and Description of New Plants, with a synopsis of the Western Species of Silene.—4. *Transactions of the Massachusetts Horticultural Society*, for the year 1874, Part II.—5. *First Annual Report of the Geological and Agricultural Survey of Texas*, by S. B. Buckley, State Geologist.—6. *Psyche*, January—April, 1875.—7. *The Naturalist Advertiser*, January, 1875 ; free by mail to all applicants, Naturalist's Agency, Salem, Mass. Contains 52 pages of titles of works, journals, and papers, in all departments of natural history.—8. *The American Naturalist*, May, 1875. The botanist will always find matter of interest in the pages of this well deserving monthly. The present No. contains: *The law of embyronic development the same in plants as in animals*, by T. A. Lapham, LL.D. ; *The fertilization of certain flowers through insect agency*, by Thomas G. Gentry ; *Botanical observations in Southern Utah, No.* 4, by Dr. C. C. Parry: the present is a list of the collection of plants made in 1874. There are also some other short botanical notes.—9. *American Garden*, Jan. —May, well sustains its character, and is full of entertaining and instructive reading. The white-berried Mitchella repens was found by a lady in Canaan, Ct. in 1872. BULL. III., 43.—10. The St Louis Democrat, Mch. 6th, 1875, contains a full report of Dr. George Engelmann's able lecture on *The Forests of the Rocky Mountains.*— 11. *Ferns a Specialty*, A. B. Gilbert's priced Catalogue of native and exotic Ferns in cultivation, Hancock St., Cambridgeport, Mass. 12. *Harvard University. Summer instruction in Chemistry, Botany, and Geology*, for 1875. Intended for teachers and other adults. A synopsis of the course in Botany will be forwarded upon application to Prof. G. L. Goodale, Cambridge, Mass. Application for places in the laboratory should be made before June 1st. A second course in Cryptogamic Botany by Prof. Farlow will be given at some locality on the seashore not at present determined. A knowledge of phænogams is *indispensable* for those taking this course. Apply on or before June 1st to Prof. W. G. Farlow, Botanic Garden, Cambridge. The fee for each course is $25 in advance. Each course will begin July 8th, and continue six weeks. As Harvard is making Botany a condition of entrance, she does well to provide instruction for teachers.

§ 29. **Sandwich Island Ferns.**—Mrs. J. M. Whitney, 753, Logan street, Cleveland, Ohio, writes that she has a large assortment of Sandwich Island ferns to dispose of, with about ten varieties from the Yo Semite. The former were named for her by Mr. Lidgate, the compiler of a list of the Island ferns, which she has had printed here, and offers for sale at 25 cts Mrs. Whitney holds her ferns at perhaps a rather high rate, but is willing to make terms.

§ 30. **Mosses of Pennsylvania.**—List of Pennsylvania mosses not heretofore acknowledged as found in the State; also, a list of rarer species collected by F. Wolle and E. A. Rau, Bethlehem, Pa. (1872—74).

New to the State. — NORTHAMPTON COUNTY: Pottia riparia, Austin; Discelium nudum, Brid.; Funaria hygrometrica, Hedw., var. patula; Leskea Austini, Sulliv.; Mnium cinclidioides, Blytt.; Ceratodon purpureus, Brid., var. aristatus; ~~Drummondia clavellata, Hook.~~; Ptychomitrium incurvum, Schwgr; Hypnum acutum, Mitt.; Hypnum diversifolium, Br. En.; Hypnum rusciforme, Wils., var.; Hypnum serpens, var. orthocladon fontanum; Hypnum nitens, Schreb.; Hypnum pygmæum, Br. En.; Hypnum Juratzkanum, Schp. Syn.—LUZERNE COUNTY: Funaria hygrometrica, Hedw., var. calvescens; Pylaisæa velutina, Schp.; Sphagnum rigidum, Schp., var. laxum.—CARBON COUNTY: Andræa petrophila, Erh.; Andræa crassinervia, Bruch; Pterigynandrum filiforme, Hedw.; Hypnum Novæ Cæsareæ, Austin; Chrysobryum micans (Wils.) Lindb., in immature fruit, September, 1874.—PIKE COUNTY: Dicranum Schraderi, Schwgr.; Omalia trichomanoides, Schreb.; Fontinalis Lescurii? Sulliv., var. cymbifolia; Hypnum uncinatum, Hedw.; Hypnum fluviatile, Swtz.; Thuidium æstivum, Austin.—LEHIGH COUNTY: Gymnostomum curvirostrum, Hedw.; Didymodon rubellus, Br. En.—BUCK'S COUNTY: Thelia Lescurii, Sulliv.; Bartramia radicalis, Beauv.

Rare Species.—NORTHAMPTON COUNTY: Anacamptodon splachnoides, Brid.; Bryum crudum, Schreb.; Bryum Lescurianum, Sull.; Barbula cuneifolia, Smith; (Greenhouses) sterile; Buxbaumia aphylla, Haller; Encalypta streptocarpa, Hedw.; Ephemerum coherens, Hedw.; Phascum cuspidatum, Schreb.; Ptychomitrium incurvum, Schwgr.; Systegium nitidulum, Schp.; Systegium Sullivantii, Schp.; Timmia megopolitana, Hedw.; Sphærangium muticum, Schreb.; Leskea denticulata, Sull. (also Pike Co.) Didymodon cylindricus, Br. En.; Desmatodon Porteri, James; Funaria flavicans, Mx.; Fabronia octoblepharis, Schwgr.; Mnium hornum, L.; M. serratum, Brid.; M. lycopodioides, Hook; Cylindrothecium brevisetum, Wils.; Hypnum filicinum L.; H. Sullivanti, Spruce; H. stellatum, Schreb.—LEHIGH COUNTY: Dicranum Schreberi, Willd.; Hypnum Bergenense, Aust.—PIKE COUNTY: Myurella Careyana, Sull.; Trematodon ambiguus, Hedw. (also Luzerne and Cambria Counties.) Bartramia Oederi, Swz.; (also Northampton Co.); Fontinalis antipyretica, L., var. gigantea; Hypnum Mullerianum, Schp.; (also Carbon Co.); H. fertile, Sendt.; H. Starkii, Brid.; H. Sommerfeltii, Myrin; H. campestre, Bruch.—CARBON COUNTY: Hypnum cylindrocarpum, C. Mull.

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§ 31. **Grape Vines.**—The American Naturalist, Vol. VI. pp. 532, seqq. republished Mr. Riley's Report (1872) to the State of Missouri on the Phylloxera, the insect that has proved so injurious to the vine. This paper contained Dr. Engelmann's Synopsis of the True Grape Vines of the Old United States together with a list of the nine species to be found in our territory. The Bulletin, Vol. V. No. 1, contained Regel's revision of the species, with a mention of his opinion that *Vitis vinifera* is a hybrid between *V. Labrusca* and *V. vulpina.* The *Grape Manual* of the *Bushberg Catalogue*, of which we have received, pp. 1-16, with a few emendations by Dr. Engelmann, contains the fullest account that we have seen of that eminent botanist's views on this subject. We add a very brief summary of the paper, recommending all interested, whether botanists or cultivators, to procure a copy of the "Manual."

It is not true that the European vines do not produce sterile plants in the same manner as the American. In *Vitis Labrusca*, as first indicated by Braun, the tendrils (or their equivalent, an inflorescence) are found opposite each leaf, *i. e., continuous.* All the other species exhibit a regular alternation of two leaves, each having a tendril opposite it, with a third leaf without such a tendril, and this arrangement may be named *intermittent tendrils.* To observe this character well it is necessary to examine well-grown canes found in early summer. In connection with this law most grape-vines bear only two inflorescences or bunches upon the same cane, while in the forms belonging to *Labrusca* there are often three, and sometimes four or five, or, rarely, even six in succession each opposite a leaf.

Only the leaves of flower-bearing canes ought to be considered the normal ones. The dull leaves, even when they lose their down, never become glossy like the shining ones. The different forms of *Riparia* and *Cordifolia* flower first, next comes *Labrusca* and its relatives (cultivated) and about two weeks later than *Riparia* comes *Æstivalis*—the limits at St. Louis varying with the season, being between May 10th and June 15th.

One of the botanical characters of the grape-vines is found in the seeds. The bunches may be larger or smaller, looser or more compact, branched (shouldered) or more simple ; the berries may be larger or smaller, of different color or consistency, and contain fewer or more seeds (never more than four) ; but the seeds, though to some extent variable, especially on account of their number and mutual pressure where more than one is present, exhibit some available differences. The big top of the seed is convex or rounded, or it is more or less deeply notched. The thin lower end of the seed, the beak, is short and abrupt, or it is more or less elongated. On the inner (ventral) side are two shallow longitudinal depressions. Between them is a ridge, slight where there are one or two seeds, or sharper where the seeds are in threes or fours; along this ridge the *raphe* (the attached funiculus or cord) runs from the *hilum*, at the beak, over the top of the seed, and ends on its back in an oval or circular well-marked spot, called by botanists *chalaza.* This raphe is on that ridge represented by a slender thread, which on the top and back of the seed is entirely indistinct, or scarcely perceptible, or it is more or less prominent like a thread. In our American species these characters seem pretty trustworthy. There are given cuts of grape-seeds to illustrate the different characters. *V. æstivalis* has the raphe and more or less circular chalaza strongly developed. *V. riparia* has the seeds obtuse, or very slightly depressed on top, chalaza rather flat, elongated, and gradually lost in a groove which encloses the scarcely prominent raphe. *V. cordifola* is similar, but the raphe is usually more prominent, and nearer to that of *V. æstivalis.* *V. Labrusca* has the seeds large and notched, rather flat chalaza and no raphe seen in the groove which extends from the chalaza to the notch. *V. vulpina* has a very distinct seed, flatter, with straighter sides, wrinkled on both surfaces, notched on top, narrow chalaza, and no visible raphe. The seeds of European vines are easily distinguished from all American grape-seeds by the narrower and usually longer beak, and especially by the large, though not very prominent chalaza, which occupies the upper and not the middle part of the seed.

Dr. Engelmann does not favor Regel's attempt to unite our species with those of the old world. *V. vinifera* finds its place between *V. riparia* and *V. æstivalis.* It belongs to the earliest acquisitions of cultivation. Not only have the sepulchres of the mummies of ancient Egypt preserved us its fruit (large-sized berries) and seed, but its seeds have even been discovered in the lacustrian habitations of Northern Italy. Its native country is a question. Regel's theory has been given in the place quoted. Prof. Braun of Berlin suggests that the different varieties are the offspring of distinct species yet found wild in many parts of Southern Europe and Asia, which thus he considers not the accidental offspring of the cultivated plants, as is generally believed, but the original parent stock. Dr. Engelmann adds from his own investigations that the grape-vine which inhabits the native forests of the "bottom lands" of the Danube well represents our *V. cordifolia* and *V. riparia*, while the wild grape of the hilly countries of Tuscany and Rome reminds him of *V. æstivalis.* The latter was known to the ancients as *Labrusca*, a name improperly applied by science to the American species, and is called by the natives to this day *Brusca.* The grape-vines of the countries south of the Caucasus mountains, the ancient Colchis, the reputed original home of these plants, greatly resemble the Italian plant just described.

The number of true grape-vines in the present territory of the United States, considered good species, is limited to nine, of which we copy the description. It will be seen that the first four species are more or less glabrous, the next four more or less woolly or cottony, the ninth again glabrous. The first six have smaller berries, the others larger ones.

1. *Grape-vines with loose shreddy bark, climbing by the aid of branched tendrils, or (in No. 1) without tendrils and not climbing at all.*

a. **Berries small, 3-6 or rarely 7 lines in diameter, (in No. 7 larger,) seeds more or less rounded on the top, with the raphe often more or less prominent on the top and back, or inconspicuous. All the species of this group have (on well grown shoots) intermittent tendrils.**

1. **V. rupestris,** Scheele. Bush Grape or Sand Grape.—A small bushy plant, often without any tendrils, rarely somewhat climbing; leaves small (2-3 inches wide) and often folded, mostly broader than long, heart-shape or truncate at base, scarcely ever slightly lobed, with broad coarse teeth and usually an abruptly elongated point, glabrous, and of a glaucous or light green color; berries middle sized, in very small bunches; seeds mostly 3-4, round, with an extremely short beak, obtuse, with a small chalaza; raphe very slender or invisible. Missouri to Texas and probably New Mexico. In Missouri and Arkansas it grows on the gravelly banks and overflowed bars of mountain streams; in Texas also on rocky plains, whence the Latin name. Its luscious fruit ripens in Missouri in August. Not cultivated.

2. **V. cordifolia,** Mchx. Winter, Frost, or Chicken Grape.—Tall (or more rarely low), climbing by the aid of intermitting branched tendrils, trunks often 6-9 inches in diameter, with loose shreddy bark. Leaves middle-sized or small (2½-3 or 4 inches in diameter), *round-heart shaped*, or truncate at base, mostly entire or very slightly tri-lobed on the edges, with broad shallow teeth, usually smooth and shining, more on the upper than on the lower side; the young ones sometimes, and very rarely the old ones, with short hair on the ribs below; panicles compound, large and loose; berries among the smallest, in large mostly loose bunches, black, without a bloom and without tough pulp; maturing late in the fall, usually with a single short and thick seed, marked by a more or less prominent raphe. New England to Texas and westward to the limits of the wooded part of the Mississippi valley. The flowers, principally the sterile (male), are especially fragrant. Not cultivated.

3. **V. riparia,** Mchx. Riverside Grape.—Similar to the last, but usually a smaller plant, with larger (3–5 inches in diameter) and more or less incisely 3-lobed, glabrous, shining (or rarely, when young, slightly hairy) leaves, the lobes long and pointed, the teeth also more pointed than in *V. cordifolia*; panicles rather small and compact; *berries* usually larger than in the last, mostly with a bloom, in smaller and often more compact bunches, without pulp, commonly 1 or 2-seeded; seeds obtuse, or sometimes very slightly depressed, with the raphe often almost obliterated. As far to the south as the last, and much farther north and west. It is the only grape-vine in Lower Canada, being found even 60 miles north of Quebec, and the only one on the eastern slope of the Rocky Mountains. The northern form, in Canada, northern New York to Michigan and Nebraska, has fewer and larger berries in a bunch and is easily distinguished from *V. cordifolia.* The south-western form, however, a taller plant, with smaller black berries, approaches more closely to this last species. The fruit ripens earlier and is much pleasanter. Cultivated.

4. **V. Arizonica,** Englmn. Arizona Grape.—Similar to *V. Californica*, but tomentose only when young, later glabrous, with middle-sized berries, reported to be of luscious taste.

5. **V. Californica.** Bentham. California Grape.—The only wild grape of California, has rounded, downy leaves, and small berries, and is not made use of as far as known. The seeds are obtuse, with a short beak, elongated chalaza, and very slender raphe.

6. **V. æstivalis,** Mchx. Summer Grape.—Climbing over bushes and small trees, by the aid of forked, intermittent tendrils; leaves large (4–5 or six inches wide), of firm texture, entire or often more or less deeply and obtusely 3–5 lobed, with rounded sinus, and with short and broad teeth; when young, always very woolly or cottony, mostly bright red or rusty; at last smoothish, but dull, and never shining like *V. riparia;* berries usually larger than in this species, coated with a distinct bloom, and, when well grown, in compact bunches; *seeds*, usually 2 or 3, rounded on top, with a very prominent raphe. Throughout the Middle and Southern States. Var. *Lincecumii*, Post Oak Grape of the sandy soils of Louisiana and Texas, more bushy than climbing, with deeply lobed, rusty, downy leaves and sweet fruit. Var. *monticola*, Mountain Grape of Texas, with small entire leaves (the down of which at last is gathered in little tufts) and large acidulous berries. Var. *cinerea*, with ashy white, downy, scarcely-lobed leaves, with fruit like the last variety. It is not always easy to distinguish such varieties from the other species, unless the essential characters above enumerated be closely attended to, and the numberless gradual transitions from one form to the other be watched. Cultivated.

7. **V. candicans,** Englmn. Mustang Grape, of Texas.—A tall climber, with rather large, rounded, almost toothless leaves, white cottony on the under side, bearing large berries, which, like those of the wild *Labrusca*, show different colors, greenish, claret, and bluish-black; and which, in its native country, are made into wine. In young shoots and sprouts the leaves are usually deeply and elegantly many-lobed.

b. Berries large, 7-9 or even 10 lines in diameter; raphe scarcely visible on the moe or less deeply-notched top of the seed; tendrils continuous.

8. **V. Labrusca,** L. Northern Fox Grape.—Plant usually not large, stems with loose, shreddy bark, climbing over bushes or small trees, though occasionally reaching the tops of the highest trees. Tendrils continuous, branched. *Leaves* (4–6 inches wide) large and thick, entire, or sometimes deeply lobed, very slightly dentate, coated, when young, with a thick, rusty, or sometimes whitish, wool or down, which, in the wild plants, remains on the lower side, but almost always disappears in the mature leaf of some cultivated varieties; *berries* large, in middle-sized, or, in some cultivated varieties, rather large bunches, bearing two or three, or sometimes four seeds. New England to South Carolina, where it prefers wet thickets; it extends into the Alleghany Mountains, and here and there even down their western declivities, but it is a stranger to the Mississippi

Valley. By far the largest number of varieties of grape-vines now cultivated in our country are the offspring of this species—a few produced by nursery men, but most of them picked up in the woods.

II. Grape-vines with (on the younger branches) firmly adhering bark, which only in the older stems scales off; aerial roots from inclined trunks in damp localities; tendrils intermittent, simple; berries very large (7–10 lines thick), very few in a bunch, easily detaching themselves at maturity; seeds with transverse wrinkles or shallow grooves on both sides.

9. **V. vulpina**, L. Southern Fox Grape, or Muscadine.—Low, or often climbing very high, with small (2, or, at most, 3 inches wide), rounded heart shaped, firm and glossy dark green leaves, smooth, or rarely slightly hairy on the under side, with coarse and large, or broad and bluntish teeth. South from Maryland, Kentucky and Arkansas. Cultivated, especially the white *Scuppernong* variety.

§ 32. **Club Investigations.**—There have been three subjects proposed for investigation by the Club this year, viz.: 1. The plants that have a tendency to be evergreen in our climate, or to keep their leaves in whole or in part on into the winter. 2. The plants which conceal or protect the leaf-bud within the base of the petiole. 3. Carnivorous plants; it is conjectured that examination will disclose a number of plants that seem intended to do insects to death, Catchflies and Robinia viscosa for example. The chairmen of the committees are respectively E. S. Miller, of Wading River, Long Island, G. M. Wilber and W. H. Leggett, who may be addressed at 224, E. 10th St., New York. Communications on these subjects will be welcomed by the committees.

§ 33. ADDITIONS AND CORRECTIONS FOR BOTANICAL DIRECTORY.

Clarke, Miss Cora H., Box 108, Jamaica Plain, Mass.
Farlow, Prof, Wm. G., Botanic Garden, Cambridge, Mass.
Febiger, Christian, Wilmington, New Castle Co., Del. *Microscopic Algæ. Spec. Diatomaceæ.*
Forney, D. S., Allisonia, Pulaski Co., Va.
Friese, V., Fort Defiance, New Mexico.
Garber, Dr. A. P., Columbia, Lancaster Co., Pa.
Greene, Rev. E. L., Georgetown, Col.
Hervey, Rev. A. B., 10, N. Second St., Troy, N. Y. *Algæ Ex.*
Hyamus, M. E., Statesville, Indell Co., N. C. *Ex.*
Klippart, John H., Columbus, Ohio.
Loomis, Miss H. A., Oakland, Cal. *Ex.*
Mathews, Mrs. Maria D., Painesville, Ohio,
Merriam, Jas. S., 61 Liberty St., New York,
Morong, Rev. Thos, Ipswich, Mass.
Nevins, Rev. R. D., Baker City, Oregon.
Prescott, Miss Lucinda T., Painesville, Ohio.
Ridgway, Robert, Mt. Carmel, Ill.
Schneck, Dr. J., Mt. Carmel, Ill.
Shriver, Howard, Wytheville, Wythe Co., Va.
Tallichet, H., Wilmington, N. C. *Living Dionæa and other insectivorous plants.*
Watson, Sereno, Cambridge, Mass. *Omit Spec. Western.*
Wheeler, Chas. F., Hubbardston, Ionia Co., Mich. *Ex.*
Wibbe, Rev. H., St. Peter's Church, Oswego, N. Y. *Ex.*

§ 34. **New Musci**, by C. F. AUSTIN.

1. **Ephemerum (Micrometrium) Jamesii.** *n. sp.*—Plantæ minutissimæ, in prothallio byssoideo sparso persistente nidulantes, fere acaules, foliis erectis angustissimis lineali-subulatis attenuatis laxe textis serrato dentatis nervo indistincte superne notatis; capsula inclusa minutissime globosa indistinctissime apiculata clausa in vaginulam breviter ovalem sessili cum pedicello minutissimo nigro decidua, calyptra concentrica stylidiformi (basi vix expansa) crassiuscula vix $\frac{1}{700}$ unc. longa apice infundibuliformi, sporis minutis

circa $\frac{1}{1000}$-$\frac{1}{1200}$ unc. metientibus lævibus rufescentibus; inflorescentia synoica, antheridiis paucis minutissimis, paraphysibus nullis? South America, *Spruce*; with *Ephemerum æquinoctiale*, Mitt. Detected and communicated by *Dr. T. P. James.* Smaller than even
M\ *N. megalosporum.* Remarkable for its very narrow, erect, nerved often subsecund leaves, with the apex often abruptly bent downwards; reticulation about as in *Ephemerum serratum.* Calyptra and spores the smallest of the genus. Capsula dark colored.

2. **Gymnostomum tophaceum,** *n. sp.*—Dioicum; magnitudine adspectuque, *G. curvirostri*; Cæspite inferne fusco tophaceo, caule apice parum fasciculato-ramoso, foliis in siccis apertis leniter tortilibus madefactis recurvo-patulis ligulato-vel oblongo-lanceolatis subcarinatis utrinque minutim papillosis, margine latiuscule recurvis haud decurrentibus, apice plerumque obtusis (aliis valde obtusis aliis acutiusculis), superne minutissime confertim inferne laxiuscule subpellucido areolatis, costa mediocri subterreti paulum infra apicem evanida, perichætialibus subconformibus erectis semivaginantibus, pistillidiis eparaphysatis, capsula oblongo-ovali, erecta (gymnostoma) tenui texta obscure annulata, operculo longe rectiuscule rostrato. pl. masc. ignota.

On wet and calcareous rocks, Dallas County, Texas, Mr. Boll. Communicated by *Dr. T. P. James.*

3. **Gymnostomum? Clintoni,** *n. sp.*—Dioicum, minutulum; caule subflexuoso cæspitoso subsimplici, foliis siccatis erectis subtortuosis madefactis erecto-patentibus ovato-et oblongo-linearibus raptim acutatis minutim apiculatis concavo-canaliculatis opacis obscure papillosis, margine (basi apiceque exceptis) late incurvis, costa validiuscula ad apicem vel paullulum infra desinienti, areolis minutis subuniformibus, perichætialibus e basi ovata lingulatis: pl. masc. et fructu ignotis. Didymodon Clintoni, Aust. in litt.

Western New York, *Clinton.*

A small species, chiefly characterized by the concave apiculate leaves broadly incurved on the margin, except at the extreme base and apex. Color fuscous.

4. **Pottia Pharomitrium exiguum,** *n. sp.*—Plantæ perminutæ gemmiformes, cæspitulos fusco-vel rufo-incanos formantes, monoicæ; caule perbrevi subsimplici, foliis arcte imbricatis rotundo-ovatis valde concavis vulgo acutis dorso lævibus, apice distincte serrato extremo sæpissime in dentibus duobus subulatis producto eo et margine versus eum magis minusve echlorophyllosis, costa in aristam perlongam incanam scabram producta folliculos vel lamellas duas deplanatas apice valde dilatato et margine versus eum dentato ferente, capsula globosa in pedicello perbrevi tenui immersa exannulata, operculo majusculo e basi convexa breviter recte (semper?) rostrato, calyptra (fere ut in *Bruchiis*) magna usque ad medium capsulæ decedente mitriformi basi profunde fissa, sporis castaneis subpellucidis lævissimis; floribus monoicis, antheridiis versus basin caulis positis folio perigoniali unico obtectis paraphysibus subclavatis immixtis.—*Pharomitrium incanum*, Aust. MSS. olim. *Pottia subsessilis Sulliv. and Lesqx. Musc. Exsic. ed.* 2, *n.* 118. Texas, *Wright.* Illinois, *Hall.* *Pharomitrium subsessile*, Br. Eu. is twice

as large as our plant, which is not larger than *Acaulon muticum;* the stems are also longer and much more distinctly innovating below the apex; leaves more loosely imbricated, obovate-oblong, towards the apex (which is subcucullate), rather strongly papillose on the back usually incurved and entire and early subechlorophyllose on the margins, areolation at the base less lax, costa with the excurrent portion shorter, narrower and less scabrous, its lamellæ (2–4) vertical and wavy, and with the margins entire; capsule somewhat exserted, larger, wider-mouthed, somewhat constricted under the mouth when dry; its rim is distinctly seen to be formed of a more solid row of cells; operculum with a longer rostratum; calyptra smaller (barely more than covering the operculum); spores larger, fuscous, very opaque, minutely but distinctly papillose; male flower near the apex of the stem, etc.

5 *Barbula Rauei, n. sp.*—Plantæ perhumiles gregario-cæspitosæ annuæ; caule perbrevi inferne nudo vel microphyllo, foliis rigidiusculis in rosulam congestis siccitate crispatis spathulato-ovatis cymbiformi-concavis acute acuminato-apiculatis lævibus margine planis, costa validiuscula nuda cum acumine vel paullulum infra eum desinienti, reti basilari laxo cæteroquin parvo subobscuro inæquali subrotundo, perichætialibus tenuioribus (haud exsertis) convolutis sæpe muticis tenuiter obsoleteve costatis, capsula in pedicello pertenui semiunciali erecta oblongo-cylindrica siccitate costata atque leniter ad dextram torta, annulo augusto, peristomium dentibus longis in fune arcte contorquatis fere ad basin discretis, operculo elongato-conico (rostrato) recto, calyptra vix dimidiam partem capsulæ obtegente longe rostrata leniter torta; inflorescentia dioica, flores utriusque sexus paucissime paraphysatis, paraphysibus cylindricis: plantæ masculares triplo-quintuplo minores inter femineas mixtæ; foliis indistincte eroso-dentatis omnibus valide costatis, paraphysibus subnullis.

On rocks, Matagorda County, Texas, *R. G. Bechdolt* (July 1870). Communicated by *Mr. E. A. Rau.*

A small species, readily distinguished by the spatulate concave acute smooth leaves, by the much twisted peristome without a basilar membrane, by the minute size of the male plants (growing with the female), &c.

6. **Grimmia Jamesii,** *n. sp.*—Pulvinato-cæspitosa; caule brevi radiculoso, foliis in siccis erectis inferioribus parvis appressis muticis superioribus fragilibus raptim in comam augentibus confertis oblongo-vel ovato-lingulatis dimidio superiore convoluto-concavis lævibus margine planis nudis, apice in pilum subulato-filiformem incanum scabrum producto, costa mediocri ad apicem desinienti, areolis inferioribus parvis quadratis pellucidis cæteris valde obscuris minutisque, capsula rotundo-ovali in pedicello pertenui flavido leniter exserta e flavida ad rubrum transeunti siccitate macrostoma obconica leniter striata, annulo angustissimo (nullove ?), peristomii dentibus pallido rubris brevissimis latis tri—quadrifidis inferne valde cribrosis, operculo brevissime convexo-acuminato, calyptra magna cucullato-campanulata basi inæqualiter parum lobata.—Grimmia orbicularis, James in Watson's Catalogue of the Plants of

1-Com. p. 52.

the 40th Parallel, p. 403. ¶ *Grimmia* (*Coscinodon*) *Wrightii* Sulliv. has leaves broadly obvate with a longer and narrower hair-point, capsula oblong-oval, operculum shortly rostrate, peristomal teeth longer, annulus broader, calyptra campanulate, &c.

An elegant species, differing from *Grimmia cribrosa* Hedw. (*Coscinodon pulvinatus*, Spreng.) in its narrower leaves, with the marginal cells at the base enlarged, pale yellow pedicel, smaller round-oval capsule passing from yellow to red at maturity, the walls thinner, and without the black border at the mouth, annulus much narrower, operculum very short, teeth of the peristome paler, shorter, broader, and with more distinct cross-bars, calyptra dimidiate, &c.

7. **Brachythecium salebrosum**, var. **Texanum.**—A forma normali distinguitur, capsula ferruginea oblongo-cylindrica erecto-incurva basi haud abrupte in pedicello crassiori pallidiori transeunte foliis caulinis abrupte subulato-acuminatis inferioribus semper integerrimis superioribus serratis, perichætialibus subulato-lanceolatis haud abrupte filiformi-attenuatis subsemicostatis. Dallas County, Texas, *Mr. Boll.* (*James.*)

8. **Hypnum** (**Rhynchostegium?**) **scitulum**, *n. sp.*—Dioicum;
o/ caule stoloniformi pulvinato-cæspitose erecto (semper?) parce innovandi-ramoso 5-10 lineari, foliis plurifariis rectis suberectisque laxiuscule dispositis anguste vel subulato-lanceolatis nitidis sensim subpiliformi-attenuatis concavis parce lenissime striatulis ecostatis vel costa brevi tenuissima simplici et duplici instructis, toto margine (apice extremo excepta) distincte recurva integerrima, reti perminuto e cellulis confertis apicalibus subrhombeis cæteris
e/ fere usque ad basin angusta fusiformibus exstructo. (An Plagiothecii species?). Mixed with *Hypnum Sprucei* in Drummond's Musci of British and Arctic America. The specimen communi-
6/ cated by Mr. Sullivant in 1849.

In habit this moss resembles *Plagiothecium Passaicense*, Aust., but is much larger (a little larger than *Pl. pulchellum*, Dicks.). It also resembles *Hypnum cylindricarpum* in size and in the reddish color of the stems, which shows through the leaves under the lens. It is remarkable for its narrow straight leaves distinctly recurved on the entire margins, with the cells at the base not widened and scarcely any of them shortened, while those from far above the middle towards the apex become gradually much shortened. The female flowers are numerous and scattered from the base to above the middle of the stem. Male fls. and fruit not seen.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 35. New Mosses from Colorado, by C. F. AUSTIN.

Grimmia Brandegei, *n. sp.*—Plantæ parvulæ saturate virides; foliis oblongo-lanceolatis sublingulatisve concavis (haud carinatis), margine plana, apice in pilum longum incanum producto, costa tenuissima infra apicem desinienti, reti superiore minutissimo obscuro granuloso basilari laxo hyalino oblongo vel ovali tetra—hexangulari, capsula in pedicello brevissimo flexuoso immersa basi valde gibbosa haud striata ovata, annulo lato triplici, operculo brevissime rostrato, peristomii dentibus late lanceolatis erectis pallido aurantiaceis valde cribrosis apice laceratis, calyptra parva mitræformi vix infra operculum descendente e basi convexa conica breviter rostrata: inflorescentia dioica?

Colorado, *Dr. Brandegee*, (*Rau.*)

The chief distinctive characters of this species are the light costa, minute areolation of the upper part of the leaf, the erect cribrose broad lanceolate peristomal teeth, the short much crimped pedicel and strongly ventricose-gibbous base of the capsule. Male inflorescence not seen.

Near *G. plagiopodia*, Hedw.; but that is of a fuscous green or grizzly color, leaves ovate or oblong-ovate, mostly obtuse, costa stouter more widened above, capsule wider mouthed when dry, operculum convex, teeth of the peristome widely spreading when dry, annulus much narrower, etc. Shape and texture of the leaf about as in *G. Jamesii* (Aust. in the BULLETIN for June, p. 43,) but, besides other differences, that has a much stouter costa, a larger darker colored nearly globose capsule on a straight (or nearly so) pedicel, a convex-conic operculum and a large subcucullate calyptra.

Grimmia brachyodon, *n. sp.*—Plantæ parvulæ cæspitosæ; caule perbrevi, foliis laxiuscule dispositis siccitate vix mutantibus subflexuosis, inferioribus lineali-lanceolatis valde concavis pilo brevi instructis, superioribus oblongo-lanceolatis sublingulatisve concavis (haud carinatis) margine planis apice in pilum longum incanum productis, costa sursum leniter incrassata sub apice evanida, reti subsinuoso basilari laxiusculo brevi quadrangulari, capsula in pedicello brevi curvulo subexserta ovali in siccis truncato-obovatis striatulis, operculo deplanato in medio mammillato-umbonato, annulo nullo? peristomii dentibus brevissimis truncatis valde cribrosis in siccis patenti-recurvis; calyptra haud visa: florescentia dioica? pl. masc. ignota.—**Grimmia Montana**, var. Sulliv. & Lesqx. Exsic. Ed. 2, n. 215, pro parte.

The distinctive characters of this species are its small size, short slightly curved (not twisted) pedicel, flat (always?) operculum, short truncate cribrose peristomal teeth, regular substriate capsule, subsinuous areolation very gradually passing into short rectangular towards the base, where it is somewhat enlarged and subpellucid. Resembles in some respects the European *G. curvula*, Bruch; but that has the leaves longer and with longer hair-points, areolation not sinuous and suddenly becoming much longer and more lax below the middle, capsule on a strongly twisted pedicel, somewhat urceolate when dry, operculum more convex, peristomal teeth large, lanceolate, etc. *G. Jamesii*, Aust., has a similar peristome; but the capsule, operculum, texture of the leaf, etc., are very different.

Grimmia (Coscinodon) Rauei, *n. sp.*—Plantæ in cæspites sordido-virides facile solubiles congestæ, terra obrutæ; foliis obovatis et obovato-spathulatis laxe imbricantibus breviter acuminatis margine planis integerrimis vel ad apicem lenissime eroso-dentatis, apice in pilum longiusculum producto, costa valida sub apice finienti, inflorescentia monoica, capsula in pedicello brevissimo immersa oblongo-ovali pallida basi truncata estriata tenui membranacea, annulo lato persistente, operculo brevi rostrato, peristomio rubro siccitate erecto in humido paululum hiante dentibus lineali-lanceolatis apice filiforme attenuatis integris dimidio inferiore rimosis exstructo calyptra mitræformi multoties sed leviter plicata ad capsulæ medium descendente.—Colorado, *Dr. Brandegee*, (*Rau*).

Shape and texture of the leaf much as in *Grimmia Wrightii* (Sulliv.) (*Coscinodon Wrightii*, Sulliv. Icon. Musc. p. 71, t. 45), which Dr. Brandegee has also found in Colorado; but that has the stems subjulaceo-clavate, leaves more appressed, the apex more scarious and decidedly denticulate, costa extending into the much longer more terete and more scabrous hair-point, capsule shorter and broader, teeth of the peristome much shorter, more cribrose, fissured at the apex, scarcely if at all divergent when moist (erect when dry). *Grimmia crinita*, Brid., also has leaf of about the same shape and texture, but the costa is lighter and excurrent; the capsule is on a longer more strongly curved pedicel, calyptra smooth, stems clavate, etc.

Mem. *Grimmia* (*Coscinodon*) *cribrosa*, Hedw., has the peristomal teeth more or less incurved when dry and slightly spreading when moist.

Weisia (Gymnostomum) Brandegei, *n. sp.*—In adspectu formis majoribus *W. viridulæ* simulans, sed foliis brevioribus ratione latioribus margine latius lamellatis apice haud vel brevius mucronulatis, capsula gymnostoma exannulata? flore masc. majore, etc., statim dignoscitur. Colorado, *Dr. Brandegee* (*Rau*).

Capsule rather strongly ribbed when dry, often decidedly irregular, and then with the mouth oblique. Texture of the leaves, and also of the capsule, about as in *W. viridula.*

§ 36. New Hepaticæ, by C. F. Austin.

Riccia Californica, *Aust.*, *Ms.* 1865.—Fronde solida glauca, laciniis obovatis cuneatisve supra planis canaliculatisve reticulatis margine inferne semper nudis apicem versus dense hirsuto-ciliatis vel nonnunquam (forsitan in planta juniore) etiam nudis, ciliis tenuis subfuscis; sporis *R. glaucæ*. California, *Bolander.*

About the size of *R. glauca* and *R. Lescurii*, and somewhat intermediate between them; differing from the former in the often plane ciliate divisions of the frond, and from the latter by the more crowded slenderer subfuscous ciliæ situated only at or near their apices.

Polyotus subsimplex, *n. sp.*—Caule subsimplici teretiusculo, foliis oblique ovatis subquadratisve apice magis minusve emarginato-bidentatis, margine dorsali dilatata subrepando-dentata basin versus subspinulosa, ventrali integerrima, auricula magna rotundo-galeata a caule distante, areolis majusculis rotundis, amphigastriis auriculatis brevibus triplo latioribus quam longis apice repandis varie dentatis integerrimisve (nonnunquam emarginatis).

Van Dieman's Land, *S. Mossman. Herb. Sulliv.*

Fimbriaria Palmeri, *n. sp.*—Fronde e basi angustata obcordata in medio valde incrassata late marginata supra crebre papuloso-areolata, squamis ultra marginem exstantibus atro-purpureis (raro subscariosis), receptaculo femineo oblongo- vel ovato-conico obtuso in medio leniter constricto quinquecarpo subtus nudo, perianthiis exsertis globoso-ovatis mucronulatis plerumque albidis circa 8 (—10)-fidis laciniis apice (basique) cohærentibus, pedunculo valido ultra unciam longo nudo basi haud involucrato, sporis fuscis indistincte granuloso-papillosis, elateribus breviusculis.—Gaudalupe Island, off the coast of Lower California, *Dr. Ed. Palmer* (*Watson*).

Closely allied to *F. fragrans* Nees; but that has the smaller frond less broadly margined, less thickened in the middle, areolæ not so distinct, scales much longer and scarious at the apex, female receptacle only 3 or 4 fruited, perianth more ovate, spores yellow and with a thicker jagged coat, &c.

§ 37. **Climbing plants.**—Last year there was brought to the Club meeting by Mr. J. B. Hyatt, of Morrisania, a microscopic slide containing a nicely prepared section of a stem of Rhus Toxicodendron showing the pith all on one side, like a hole bored near the edge of a coin. If the stem of this plant be examined this will be found to be the rule, the thickening being on the under side on that by which the plant clings to its support by the aid of rootlets. The same appearance may be seen in stems of Ampelopsis, but not of Tecoma, nor perhaps in Hedera. Mr. Darwin, (Journal of Linn. Soc., Vol. IX, 1867) in his paper on climbing plants, notices the thickening of the tendrils and leaf stalks of plants that climb by their means, but does not, we believe, account for, and perhaps had not seen, the extraordinary one-sided growth of Rhus. It would seem that this thickening showed that the plant was nourished by the rootlets imbedded in the bark of the tree, but this is mere conjecture. Rhus Toxicodendron seems to prefer the Red Cedar, Locust, and Cherry and to shun the Pine. Can any one give us an account of its proclivities to other trees?

§ 38. **Mycotheca Universalis.**—By Baron de Thümen, Bayreuth, Bavaria.

Two centuries are already issued, each containing 100 species of Fungi represented by dried specimens. Century III will be issued in November and will contain some of the South African Fungi. It is intended to include species from all parts of the world. Century I., which has come to hand, contains European species with some from the United States. Among the species in Century I. may be noted the following, viz.:

Trametes Pini, *Fr.*, which appears to be rare in this country. Two specc. were found, however, at Newfield, N. J., on dead trunks of pine. Hydnum Scheidermayeri, *Henfl.* Specc., found at Potsdam, New York, on dead apple tree wood seem to be identical with this. Polysaccum tuberosum, *Fr.*, from Bohemia. The only representative of this genus as yet credited to this country is P. Pisocarpium, *Fr.*, reported from Carolina by Ravenel and found also at Newfield, New Jersey. No. 63 is through some error given as Diatrype platystoma, *Ellis.* This is the Sphaeria platystoma, *Sz.* and whether properly referred to Diatrype or Hypoxylon, should still be credited to Schweinitz. The old genera Peziza and Sphaeria appear here, as in all recent continental European works, broken up into a great number of new genera the permanency and propriety of which, to say the least, is doubtful. It is designed by the author to issue two Centuries of the above work each year. Price per Century, 12s. sterling. J. B. E.

§ 39. **Virginian Flora**.—During a recent short visit to the shores of the Chesapeake on Mob-jack Bay, just north of the mouth of York River, I had an opportunity, notwithstanding frequent showers, to notice some of the vegetation. A brief account of my observations may interest our northern readers. The surface is generally level and the soil a sandy loam. The prevalent weeds in the fields were *Ambrosia artemisiæfolia*, (Hog-weed), *Erigeron Canadense*, (Horse-weed), *Solanum Carolinese*, (Horse-Nettle), with considerable *Artemisia caudata. Centaurea calcitrapa*, L., reported in Gray's Manual at Norfolk, has extended up along the shores, and is becoming a serious nuisance. *Baccharis* and *Myrica cerifera* are abundant along the fences and road sides and strike a northerner by their size. *Tecoma radicans*, Juss. (Trumpet Creeper,) seems to take the place of Rhus Toxicodendron and climbs over everything. I saw but little of the Poison-vine, and that mainly in the swamps. The prevailing tree is *Pinus Tæda* (Old-field Pine). *Pinus inops* is frequent and there is a variety of oaks, white, red, black and scrub. *Quercus virens*, Ait., (Live Oak,) reaches as far north as the shore of Mob-jack Bay, how much farther I did not learn. *Quercus Phellos*, L., (Willow Oak,) is a common tree and sometimes reaches a great size. Red Maple occurs sparingly in the swamps. The Crape Myrtle (*Lagerstrœmia Indica*) is very generally cultivated and was in fine bloom at the time of my visit.

In old fields *Linaria Elatine*, Mill., was frequent, and *Polypremum procumbens*, L., everywhere. Along the ditches *Ruellia strepens*, L., *Conoclinum cœlestinum*, DC., and *Diodia Virginica* L., were common. In more sandy places I found the other Diodia *Stylosanthes*, *Clitoria*, *Chrysopsis graminifolia*, Nutt., *Desmodium strictum*, *DC.*, with other *Desmodia* and *Lespedezæ*, two species of Lechea, various Polygalas, such as *P. Nuttallii*, *P. brevifolia*, *P. verticillata*, &c., and, to my delight, *P. incarnata*, L., which, on account of its height, about a foot, and apparently bare stems, I did not at first recognize for a Polygala, and the long looked for and seemingly distinct *P. ambigua*, Nutt., *Cacalia atriplicifolia*, L., I had not expected to find in this region. *Pluchea bifrons*, DC., as well as *P. camphorata* were not infrequent. *Polymnia Uvedalia*, L., *Verbesina Siegesbeckii*, Mchx., *Pyrrhopappus Carolinianus*, DC.; and *Borrichia frutescens*, DC., were other Composites, but the White Daisy, (Leucanthemum) and May-weed (Maruta) were scarce; indeed, I am not sure that I saw a single piece of the former, which also, a year or two since, had not reached Chicago. I was rather surprised to meet with *Althæa officinalis*, L., by the roadside. *Sida spinosa*, L., and *Symphoricarpus vulgaris*, Mchx., were abundant in certain localities. *Passiflora lutea*, L., with *Vitis vulpina*, L., *V. cordifolia*, Mchx., and *V. æstivalis*, Mchx., were frequent climbers. I noticed among Cyperaceæ, *Eleocharis rostellata*, Torr., *E. tricostata*, Torr., and, among grasses, *Arundinaria tecta*, Muhl., *Panicum viscidum*, Ell., and *Tripsacum dactyloides*, L., and the rarity of good meadow grass. Of ferns I saw nothing peculiar but their scarcity. The constant dampness of the weather limited my opportunities and spoiled my specimens.

§ 40. **Cydonia Japonica.**—At a meeting of the Botanical Club, some months since, some jelly was exhibited that was made from the Cydonia Japonica, or Japan Quince. It was also eaten freely at the collation after the business meeting, and pronounced excellent by all the members of the club then present. It much resembles our ordinary quince jelly, but has a different flavor, and a not unpleasant astringency. The fruit also makes excellent preserves. Mrs. S. H. Lewis, who made the above-mentioned jelly, furnishes the following recipe, which doubtless the club may wish to profit by: Boil the fruit in very little water till it is tender; lay this upon a sieve to drain. Make syrup of juice, two pounds sugar to one pint. Boil till clear, and skim it. For preserves, when the syrup has been boiled clear, drop in fruit, and boil very slowly for twenty or thirty minutes. I. H. H.

§ 41. **Chester County Botanists.**—[The following article was from the pen of the late Dr. Wm. Darlington, and was published in the *Village Record*, in 1857. H. J.]

Chester county has produced five botanists, who have been honored by having each a genus or species of plants named in compliment to the devotion severally manifested for vegetable science. They are as follows, viz:

1. The Genus **Marshallia** was so named by *Schreber*, in 1791, in honor of *Humphrey Marshall*, of West Bradford township, who established the Botanical Garden, at Marshalton, in 1774; published the *Arbustum Americanum* (the earliest American work on Botany) in 1785, and died November 5, 1801, aged 79 years.

2. The Genus **Baldwinia**, was named by *Thomas Nuttall*, in 1818, in honor of *William Baldwin, M.D.*, of Newlin township, a zealous and indefatigable botanist, who accompanied Major Long in his Exploring Expedition to the West, and died at Franklin, Missouri, September 1, 1819, aged 40 years.

3. The first **Darlingtonia** was dedicated by Prof. *De Candolle*, in 1825, to *Wm. Darlington, M.D.*, of Birmingham township, (now of West Chester) and author of a catalogue of the Flowering Plants growing around the Borough, in 1826; and of the *Flora Cestrica*, published in 1837; and an edition of the same, arranged in the Natural Method, published in 1853. The Genus, thus proposed,

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was afterwards merged in a prior one, called *Desmanthus ;* and a *second* **Darlingtonia** was established, on a rare and remarkable California Plant, by Prof. *Torrey*, in 1850.

4. The Genus **Townsendia** was named by Sir *Wm. J. Hooker*, in 1833, in compliment to *David Townsend*, Esq., of Coventry township, (now of West Chester), an industrious and successful investigator of the Botany of Chester county, who by the number of specimens furnished, and the elegance of their preparation, has done much toward supplying the botanists of Europe with the means of studying our vegetable productions.

5. A species of *Lichen*, viz: *Biatora* **Micheneri** was named by the distinguished cryptogamist, E. Tuckerman, A. M., in 1853, in compliment to *Ezra Michener*, M.D., of New Garden township ; an indefatigable and accomplished naturalist, who is now successfully investigating the more obscure and difficult families of our Chester county plants.

So much for Chester county. Our state has produced the following Botanists, in addition, who have been honored in the same way, viz: John Bartram, Rev. Henry Muhlenberg, Doctor Thomas Horsefield, Prof. B. S. Barton, Zaccheus Collins, Esq., Prof. Casper Wistar, Rev. Lewis D. von Schweinitz, and Major John Adlum. On the whole Pennsylvania seems to have done pretty well, in the botanical line, compared with her Sister Republics.

§ 42. **Publications.**—*The American Journal of Science and Art*, for July and August, contains a critical notice of M. C. Cooke's *Fungi ; their Nature and Uses ;* a note on *Æstivation in Asimina*, concluding that the valvate passes by gradation into the imbricate, and cannot serve, as Hooker and Bentham use it, to distinguish tribes. Prof. Goodale has a commendatory notice of the English translation of Sach's excellent *Text-book of Botany ; Morphological and Physiological.* Mr. Henry Willey gives some account of the present state of the controversy about the Schwendener theory, viz.: that Lichens are compounded of Fungi and Algæ. Of the other notes the one that interests us most is the announcement that Mr. A. Commons has discovered a new locality for *Gaylussacia brachycera*, Gray, "one of the rarest of North American plants." He found it on the banks of Indian River, in Sussex Co., Del., "on the edge of a pine forest, growing under the shade of Kalmia latifolia.—2. *The American Naturalist* for the same months has a sharp criticism of the theory propounded in the May No. in relation to *Embryonic Development in Animals and Plants.* Mr. Charles Wright seems to have found *Coreopsis discoidea*, Torr. and Gray, spontaneous in Connecticut. We are glad to see the republication of Carruther's useful article on *Ergot.* Dr. Gray describes a variety of *Botrychium simplex* from Syracuse, communicated by Mr. E. W. Munday, and also by Mrs. Styles M. Rust. He calls the variety, *bipinnatifidum.* Mr. C. F. Wheeler, who has observed the dimorphism of Menyanthes, finds the fact mentioned in the Botanische Zeitung, 1867, so that the observation, BULL., 1871, p. 26, was anticipated. There are other papers of botanical interest in the Naturalist.—3. *Ferns of Essex Co., Mass.*, by John Robinson, from the Bulletin of the Essex Institute. Essex County yields twenty-nine species belonging to sixteen genera. Mr. Robinson accepts the common explanation of the name of *Onoclea sensibilis, i. e.*, that it quickly turns black after the first frosts, and finds it confirmed by his experience. Mr. Robinson informs us that he had "two patches, six feet square in all, killed by the frosts the past winter, and a third patch only alive and no more. They were .planted in 1865, and have increased rapidly till now, producing typical and *obtusilobata* specimens by the quantity as they fancied." Onoclea sensibilis has come down to us from ancient geological ages, and it is specially interesting to learn how it fares with us in these very juvenile historic days.—4. *Field and Forest*, devoted to general natural history, Bulletin of the Potomac-side Naturalist's Club, CHARLES R. DODGE, Editor, Vol., I, Nos. 1–4, June—Sept., 1875, (pp. 1–32.) The Club is not a new institution but this is its first appearance in print, though "among its members are enrolled not a few whose names are household words in scientific circles." In the introductory Greeting, by Dr. Elliott Coues, we are given in a few words a model of a quiet association for sympathy in the study of natural history. "Without machinery to get out of order—without even an officer excepting the Secretary—the Club has pursued its even way, uneventful indeed and certainly unobtrusive, but never without interest for those in sympathy with its objects." The present enterprise is "undertaken by an indvidual with the cordial endorsement" of the Organization. Subscription price one dollar, payable in advance. J. C. Parker, News Agent, 527 7th St., Editor, P. O. Box, 273 Washington, D. C. Prof. Chickering has discovered near Washington a new locality for *Erythronium albidum*, Nutt.—5. *A List of the Marine Algœ collected by Dr. Edward Palmer on the coast of Florida and at Nassau, Bahama Islands, March–August*, 1874, *by Daniel C. Eaton, New Haven, June*, 1875.—6. *Botanischer Jahresbericht, Systematisch geordnetes Repertorium der Botanisher Literatur aller Lander, von Dr. Leopold Just.* This almost indispensable aid for working botanists may be obtained through B. Westerman & Co., New York. The two parts for 1873 have been published and that for 1874 is about ready. In the latter Dr. A. Minks of Stettin has charge of the Lichens, of which he records some 300 new species, with diagnoses.—7. Darwin's *Insectivorous Plants*, a master-piece, is republished in New York by D. Appleton & Co.

§ 43. **The Davenport Herbarium.**—Mr. Geo. E. Davenport has transferred his valuable collection of Ferns to the Massachusetts Horticultural Society. He sends us a list of *desiderata*, and solicits contributions. Specimens may be sent to his address, 8 Hamilton Place, Boston, or to Mr. E. W. Buswell, Sec. Mass. Hort. Soc., Boston, and will be gratefully acknowledged and duplicates given in exchange if desired.

Polypodium falcatum, Kel'g; ? P. Californicum, Kaulf.
Notholæna candida, Hook.
Cheilanthes aspera, Hook.; C. Lindheimeri, Hook.; C. Myriophylla, Desv. ? C. argenta, Hook.; C. Cooperæ, Eaton.
Adiantum pilosum, Fée.

? Asplenium dentatum, L.

Phegopteris Dryopteris, var. calcareum.

? Aspidium Californicum, Eaton ; ? A. Ludovicianum, Kunze. and we presume the new Botrychium simplex, var. bipinnatifidum, Gray.

§. 44. **Kentucky Plants.**—On the first of June I collected at Livingston, Rock Castle Co., Ky. : Magnolia accuminata, L.; Euonymus Americanus, L.; Trifolium procumbens, L. ; Vicia Cracca, L. ; Cratægus Crus-galli, L. ; Waldsteinia fragarioides, Tratt ; Cornus alternifolia, L. ; Mitchella repens, L. ; Viburnum acerifolium, L. ; Houstonia cærulea, L. ; Erigeron bellidifolium, Muhl. ; Coreopsis lanceolata, L. ; Vaccineum stamineum, L. ; Azalea viscosa, L. ; Kalmia latifolia, L. ; Epigæa repens, L. ; Cedronella cordata, Benth. ; Bignonia capreolata, L. ; Chionanthus Virginica, L. ; Aphyllon uniflorum, Torr. & Gray ; Pentstemon digitalis, Nutt. ; Asclepias quadrifolia, Jacq. ; Aplectrum hyemale, Nutt. ; Cypripedium acaule, Ait. ; C. pubescens, Wild. ; Smilax tamnifolia, Mchx. ; Clintonia umbellata, Torr. ; Polypodium vulgare, L. ; Pteris aquilina, L. ; Camptosorus rhizophyllus, Link ; Asplenium ebeneum, Ait. ; Aspidium Goldianum, Hook. ; Osmunda Claytoniana, L. ; O. cinnamomea, L.

Louisville, Ky. JOHN WILLIAMSON.

§ 45. **Circæa Lutetiana.**—Taking a specimen of this plant from my collecting box, where it had been left for a day or two, my attention was drawn to the clamminess of the leaves. Upon putting sections of them under a lens, I found the cells crowded with raphides. In a fresher plant I noticed the same thing not only in the leaves, bnt also the stem and root. The pith cells were filled with little ball-like transparent bodies. If some of our microscopial readers would examine and report upon this plant, it would doubtless furnish an interesting study.

§ 46. **Rhododendron Maximum, L.**—Last November the *N. Y. Evening Post* contained an account, by the Rev. A. D. Gridley, of a locality of this plant four miles north of Clinton, Oneida Co. Does any one know of a more northern locality in this State ?

§ 47. ERRATA.—April No., § ANTHOCEROTACEÆ : p. 25 ; l. 19, for "vesiculose" read vesiculose ; l. 2 from bottom for "sub genus" read sub-genus. P. 26 ; No. 2, obliterate the asterisk ; No. 4, transfer the comma after "perbrevi" to stand after "incrassata." P. 28, ll. 28 & 29, for "this and the following genus" read Anthoceros and Notothylas. P. 30 ; l. 25, for "succubous" read succubous ; l. 40, for "*fusiformis*" read *fuciformis.* May No. p. 36 ; l. 7, omit "Drummondia clavellata, Hook." ; l. 31, for "megopolitana" read megalopolitana. June No., p. 41, l. 8 from bottom, for "Micrometrium" read Micromitrium ; l. 4 from bottom, for "minutissime" read minutissima ; p. 42, l. 5, for "N." read M. "smaller" should begin a paragraph ; l. 20. add, pl. masc. ignota ; p. 43, ll. 4 and 5, read, rather strongly papillose on the back towards the apex, which is subcucullate, usually incurved &c. ; l. 30, after "mixta" put comma instead of semicolon ; p. 44, l. 1, let "Grimmia" begin a paragraph ; l. 21, for "cæspitose" read cæspitoso ; l. 28, for "angusta" read anguste ; l. 31, for "1849" read 1869.

Terms—One Dollar per annum beginning with the January number, 12 cents for postage. For the Botanical Directory 30 cents. Supplement to Directory, 10 cents. Address, WM. H. LEGGETT, *224, E. Tenth Street, New York. Money Orders on Station D., P. O., N. Y. Back volumes on hand, at one dollar each. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 48. **Valeriana sylvatica,** Richards.—This rare plant, which has been found in only two or three places in the State and then in the northern and western part, grows very abundantly in some of the marshes and swamps about Pine Plains. I detected it first last October, in a large marsh two or three miles south of the village. Having never seen V. sylvatica before, I was unable at the time fully to identify it, as there were no signs of flowers or fruit,—only the radical leaves remaining, and these, contrary to description, being much toothed. I potted a fine specimen, and kept it with the other house plants, and, in the latter part of January, it came out in full bloom, but, by an unlucky accident, the stem was broken before the fruit matured. In the latter part of May, the plants in the marshes were in blossom. There were acres of them, and the marshes were whitened by their showy corymbs, like some meadows by the *ox-eye daisy.* A few were tinged with the color of the rose, but most of them were simply white. When growing in such profusion, in blossom they make a showy spectacle, and the striking effect produced cannot fail to attract the attention of the most indifferent rustic. During the past month I have found V. sylvatica growing in three or four other marshes and swamps, which are in different directions from the village, and six or seven miles apart. Though flourishing as luxuriantly, it shows a wider range than ~~*Salix*~~ Solea *concolor*, Ging., which with us is confined to one habitat. The plant which grows here, may turn out to be a *variety* of V. sylvatica, as it does not tally very well with the descriptions given, not only in the root leaves which are coarsely toothed,—crenate,—most of them having two or three pairs of lobes each, the bases of all being very oblique, but the flowers also show a dissimilarity to the typical characteristics of the species. The fruit may differ also, but I have not yet been able to obtain any nearly mature. Dr. Gray gives its habitat in "Cedar swamps," but no cedar of any kind grows in our marshes or swamps, although *Juniperus Virginiana*, L., grows very abundantly on our surrounding hills. Its most noticeable companion plants, that is, growing together with or in close proximity to it, are *Betula pumila*, L., *Rhamnus alnifolius*, L'Her., *Myrica Gale*, L., *Viburnum Opulus*, L., *Menyanthes trifolia*, L., *Ledum latifolium*, Ait., *Chiogenes hispidula*, Torr. and Gr., *Salix candida*, Willd., *S. myrtilloides*, L., *Cypripedium spectabile*, Swartz, etc. The marshes are a little lower than the village, which is about 300 feet above Hudson River or the sea. Considering the rarity of V. sylvatica in this part of our country, I trust its detection in Pine Plains will be regarded as a very good addition to the Flora of the lower Hudson River Valley,—since, so far as I have learned, it has not been found so far south in this part of the United States. The following are its habitats previously known in New York, according to Prof. Peck, the State Botanist; Wayne County, near Lake Ontario; West Bergen Swamp, Genesee County; and Warren, Herkimer County.

PINE PLAINS, N. Y., July 8th, 1875. LYMAN H. HOYSRADT.

§ 49. **List of Mosses from the Southern part of Kerguelen Island,** Lat. 49° 21′ S., Long. 70° 15′ E., collected by J. H. Kidder, M. D., passed Asst. Surgeon U. S. Navy, in connection with the U. S. Transit of Venus Expedition, September 13th, 1874, to January 10th, 1875. Determined by Thomas P. James.

1. **Andreæa marginata,** *Hook fil. and Wilson.*—On high rocks, 1,500 feet alt.

2. **Grimmia frondosa,** sp. nov.—Laxe cæspitosa valde fastigiata ramosa fusco-viridis gracilis; folia caulina erecto-patentia, concava curvata anguste lanceolata canaliculata, in pilum hyalinum sublævem terminata, costa sub pilo evanida; inferne depilia rigida acuminata; margine erecta, cellulis basi oblongis laxioribus flavidis et usque medium folii quadratis superne remotis subrotundis versus apicem obscuris.

Growing with *Andreæa marginata*, found only in a barren condition.

3. **Grimmia Kidderi,** sp. nov.—Compacte globosa pulvinata, pusilla fastigiata ramosissima atrato-viridis rigida; folia caulina densissima, erecta patentia anguste lanceolata, inferiora canaliculata acuminata strictiuscula, superiora elongata curvula, in pilum brevem hyalinum sublævem producta; nervo ad basin lato infra apicem evanido, margine erecta, cellulis basi angustis elongatis flavidis pellucidis superne sensim quadratis minutis subopacis.

Growing on gravelly soil, in small globular masses easily detatched and blown about by the wind, very local; found only in one locality. Also in a barren state.

4. **Racomitrium lanuginosum,** *Brid.*—Common on high rocks.

5. **Ceratodon purpureus,** *Brid.*—In a variety of forms, common.

6. **Orthotrichum crassifolium,** *Hook. fil. and Wils.*, Var. *β. acutum*, Müller.—This specimen is monoicous, the male gemmæ are found terminal on separate many branched plants, also at the base of the female plants.

7. **Webera cruda,** *Schreb.*—In variety, under shade of rocks.

8. **Webera albicans,** *Whlb.*—In springy places.

9. **Webera nutans,** *Schrb.*, Var. *β. cæspitosa.*—In wet situations.

10. **Webera nutans,** *Schreb.*, Var. *γ. bicolor.*—In shady places near the sea.

11. **Bryum Warneum,** *Bland.*—Growing with Bryum bimum.

12. **Bryum Gayanum,** *Mont.*—*Rare.*

13. **Bryum bimum,** *Schrad.*—In boggy places.

14. **Bryum torquescens,** *Br. and Schp.*—In the rear of Transit-house.

15. **Bryum pallescens,** *Schwg.*—In moist situations.

16. **Bryum argenteum,** *Linn.*—In exposed places.

17. **Bartramia patens,** *Brid.*

18. **Bartramia flavicans,** *Mitt.*—Rear of Transit-house.

19. **Bartramia appressa,** *Hook fil. and Wils.*

20. **Catharina (Atrichum) compressa,** *C. Müll.*—On wet rocks.

21. **Plagiothecium Donianum,** *Smith.*—On shaded ground.

22. **Hypnum gracillimum,** *Hisch.*—In a dark cavern.

23. **Hypnum uncinatum,** *Hdw.*—Common on hillsides.

24. **Hypnum fluviatile,** *Swtz.*—Not rare.
25. **Hypnum frigidum,** *C. Müll.*—Growing with Bryum Warneum.
26. **Hypnum Lechleri,** *C. Müll.*—On low ground.
27. **Hypnum fluitans,** *Linn.*—In fresh water and among bogs.
28. **Hypnum riparium,** *Linn.*—In wet places.

§ 50. **Preissia commutata.**—I found yesterday in the Panama Ravine, growing on the rock-bottom of the creek, a new liverwort, Preissia commutata, said in Sullivan's Manual to grow at Lake Superior and Niagara Falls, the only two habitats hitherto known in this country. Male and female, fruit and summit-buds for new growths, were all present.

PANAMA, N. Y., *Sept. 16th.* EDWARD S. BURGESS.

§ 51. **Closing of Flowers at Night.**—The tendency of many flowers to open only in sunlight, and to close at night, is a fact familiar enough, especially in the case of many Compositæ. It would be interesting, however, to obtain some more definite data in regard to this subject, than we ordinarily possess. I am not aware whether it has ever been observed that the "Sow-thistle," *Sonchus oleraceus*, is a marked instance of this tendency; but so it is. In the grounds of the Hathorn Spring, at Saratoga, there is a group of these plants. During a recent sojourn in that place, I was wont to visit this spring, for a drink, early in the morning and pretty late in the evening. While the plants always attracted me in the morning, by their numerous heads of delicate yellow flowers, at night not a flower could be found—all being tightly closed. When once I had noticed this fact, I looked day after day, with care; but the result was invariably the same. I regret that I did not find opportunity to ascertain at what hour the closing begins. D. S. M.

§ 52. **Field Days of the Club.**—Among the interesting plants observed on the field days of this season the following may be mentioned: At New Durham, along the R. R. track: *Frangula Caroliniana;* among the rocks on the hill, *Silene inflata*, *Iris Virginica.* At the Homestead station of the Northern R. R. of N. J.: *Diodia teres, Glyceria obtusa.* At W. Hoboken: *Ranunculus alismaefolius.* At Guttenberg: *Coronilla varia*, first detected by Mr. Wilber; *Fragaria Indica.* At Weehawken: *Chenopodium glaucum*, which seems to be more common than *C. Botrys; Eupatorium sessilifolium*, detected by Mr. W. H. Rudkin; *Melissa officinalis, Gymnostichum Hystrix.* At Hoboken: *Echinospermum Lappula.* This plant which is new to our district, was detected by Mr. A. Brown. Its curious mouse-like odor was pointed out by Mr. Rudkin. At Silver Lake, Staten Island: *Melanthium Virginicum.* At Woodside, L. I.: *Geranium pusillum.* The station for this plant was visited, and though it used to be abundant, but two or three small specimens were found. At East Williamsburgh: *Scirpus lineatus; Galingsoga parviflora*, which is becoming common in the court-yards of Brooklyn, New York, and the neighboring towns of New Jersey. In the grounds of the U. S. Marine Hospital it is very abundant. The *Typha angustifolia* growing here has thick spikes and rather broad leaves, and seems to differ from *T. latifolia* only in the interval between the sterile and fertile portions of the spike. At Middle Village, L. I.: *Diplopappus cornifolius.* At Richmond Hill: *Pardanthus Chinensis;* it is abundant and thoroughly established. At this place a field was so covered with *Stachys hyssopifolia*, as to seem to be under cultivation. At Glendale: *Dicksonia puctilobula*, found by Mr. Rudkin. At Springfield, L. I., *Pedicularis lanceolatua; Glyceria obtusa; Gratiola aurea; Woodwardia angustifolia.* At Yonkers: *Habenaria ciliaris; Scirpus lineatus; Centaurea nigra; Æthusa Cynapium*, in the streets; *Tricuspis seslerioides; Bromus sterilis*, along the R. R. In addition to the new stations mentioned above, the following have been discovered by individuals, mostly during the last and present seasons: *Hieracium aurantiacum*, near New Dorp, Staten Island, *G. M. Wilbur*, new to our general flora. *Lysimachia thyrsifolia*, Vanderveer's Creek, L. I., *W. H. Rudkin*, Woodside, *A. Brown. Liatris spicata*, White Mills, L. I., *W. H. Rudkin. Asclepias verticillata*, Mt. Clair Heights, N. J., *W. H. Rudkin. Ægopodium podagraria*, Maspeth, *M. R. Æthusa Cynapium*, Maspeth, *M. R. Silphium perfoliatum*, Banks of Harlem River at Carmansville, *M. R. Actinomeris squarrosa*, fields about Mt. Clair Station, N. J., *Mr. Addison Brown*,—an interesting discovery. *Chenopodium leptophyllum*, Coney Island, alongside the plank walk leading from the new R. R. Station to George's Hotel. This is by far the most interesting discovery made this season. The plants which lie before me bear strict comparison with those sent me by Mr. F. W. Hall, of New Haven. It is likely to occur elsewhere on the sandy shores of Long Island. M. Ruger.

§ 53. **Rhododendron maximum,** L.—In answer to the interrogatory in the August Bulletin as to this plant, I would say that in 1855, while I was staying at New Russia, Essex Co., N. Y., some leaves, which I have still in my herbarium, were brought me from a swamp about eight miles from that place, where I was told it grew abundantly.

J. W. Congdon.

Mr. Charles J. Sprague writes us that he found it growing, years ago, near Sebago Lake, some twenty miles from Portland, Maine. These two localities are very nearly in the same latitude, viz.: About 44°. Is this the northern limit of the species?

§ 54. **Rare Plants.**—I have been fortunate to rediscover *Saxifraga Aizoon*, Jacq., this summer at Willoughby, Vt., where Mr. Blake once found a single specimen. I found only four. But a still greater find has been made by Mr. C. G. Pringle, of Charlotte, Vt. He has had the good fortune to rediscover *Astragalus Robbinsii*, Gray, on the ledges of the Winooski River not far from the original but now extinct locality.

J. W. Congdon.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. Dr. Thurber, *the President of the Club, may be found at 245 Broadway.*

Vol. VI, No. 10.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Oct., 1875.

§ 55. Lichens of Kerguelen's Land.

The Lichens of this island were first observed by Dr. J. D. Hooker, during the voyage of the Erebus and Terror (1839–1843) and his specimens were studied by Dr. Thomas Taylor; according to whose reckoning (Lich. Antarct. in Lond. Journ. Bot., 3, p. 634) the whole number of species was sixteen. Dr. Taylor's herbarium is now included in that of the Boston Society of Natural History, but contains unfortunately very little to illustrate his Kerguelen determinations; and the lack of microscopical analysis makes it difficult therefore to avail ourselves of his work.

The collection now before me, made by Dr. Kidder, naturalist of the U. S. Transit Expedition of the present year contains more or less satisfactory evidence of as many as twenty species, though not all of them determinable. Adding the three found in the Taylor herbarium, the whole number, according to this reckoning, will be twenty-three. And as eight or nine others are found in Taylor's list, there is no doubt that this little Lichen-Flora is larger than it was taken to be.

1. **Usnea sulphurea** (Müll.) Th. Fr. (U. melaxantha, Ach.)—Rocks—According to Taylor the place of this well known antarctic lichen is taken in Kerguelen's Land by another, the U. Taylori, J. D. Hook., called "handsomest of the vegetable products of this the island of Desolation." But this last, though received by Nylander (Neuropogon Taylori, Nyl. Syn., 1, p. 273) is hardly well discriminated from the older species by the description of either author; and I cannot separate any of the numerous specimens before me from others got, during the same voyage, at the Falkland Islands (Herb. Hook.) which Taylor and Nylander appear to have referred to U. melaxantha.

2. **Pannaria Taylori** (sp. nova) thallo foliaceo cartilagineo appresso luteo-fulvo, lobis apice rotundatis crenatis incisisque, subtus nigris hypothallo obsolescente; apotheciis (demum plusquam 2 millim. latis) lecanorinis sessilibus, margine crasso ruguloso, disco plano fuscescente. Sporæ ellipsoideæ, simplices, incolores, 0,016–21$^{\text{mm.}}$ long, 0,009–11$^{\text{mm.}}$ crass.—Rocks, *Hooker* (Herb. Taylor.)—Medullary layer of compact, elongated cells. Collogonidia 0,002–5$^{\text{mm.}}$ in diameter, solitary, or in chains of 2–5. The specimen is rather more than an inch across. It occurs with Placodium elegans, but wrapped apart, in Dr. Taylor's collection.

3. **Pannaria glaucella** (sp. nova) thallo foliaceo cartilagineo arcte appresso glauco-cinerascente, subtus pallido hypothallo obsoleto, lobis radiantibus subintegris; apotheciis (0$^{\text{mm.}}$,006–8 latis) lecanorinis adnatis, margine integro demisso, disco dein convexo fusco-nigro. Sporæ immaturæ.—Rocks.—Specimens scarcely half an inch across. Elongated cells of medullary layer compact. Collogonidia 0,004–9$^{\text{mm.}}$ in diameter, in chains often of 4–10.

4. **Placodium elegans**, (Link.) DC.—Rocks, *Hooker*, (Herb. Tayl.)—Spores 0,010–17$^{\text{mm.}}$ long, and 0,007–9$^{\text{mm.}}$ thick. Called Lecanora murorum by Dr. Taylor (herb.) but not reckoned in his Lichenes Antarct. l. c. It is perhaps better referable as above.

5. **Placodium bicolor** (sp. nova) thallo crustaceo-adnato

rimoso-areolato aurantiaco, cephalodio centrali (6–10 mm. lat.) pluribusve depressis radiatim rimosis, concoloribus onusto, ambitu lobato; apotheciis (2–3 mm. lat.) sessilibus, disco plano nigro-fusco, margine tenui demisso subintegro. Sporæ in thecis uniserialiter octonæ, ellipsoideæ, polari-biloculares, 0,020–30$^{\text{mm.}}$ lat., 0,012–20$^{\text{mm.}}$ crass., paraphysibus capillaribus. — Rocks. — Collogonidia of the cephalodia 0,006–9$^{\text{mm.}}$ in diameter, reddish, solitary or in short chains. The name and much of the character of Lecanora dichroa, Tayl., l. c., suggest the present lichen; but the infertile specimen called (notwithstanding its orange colour) Lecanora gelida by Taylor (herb.) appears to me to belong here. Thallus at length two inches wide.

6. **Lecanora gelida,** (L.) Ach.—Rocks.—Thallus and cephalodia stouter than I have see them in the northern lichen. Spores 0,015–23$^{\text{mm.}}$ long, and 0,006–12$^{\text{mm.}}$ thick.

7. **L. Hageni,** (Ach.) Koerb.—Rocks.—Several minute, lecanorine apothecia with white, crenate margins, appear to belong here, but have afforded no sufficient analysis. Taylor reckons L. subfusca in his list.

8. **L. macrophthalma,** (Tayl.) Nyl. Urceolaria, Tayl. l. c., Lecanora, Nyl. in Flora, 1858 cit. Krempelh.—Rocks.—Thallus like that of L. gelida, with which it agrees in possessing similar, but more depressed cephalodia; being the third lichen thus curiously characterized in this small collection. The apothecia are externally best comparable with those of Lecidea endochlora (Tayl. sub Urceolaria) but the lichen is probably to be referred to the sect. Aspicilia; though spermogones have not been observed. Thalli exceeding two inches in width.

9. **URCEOLINA** (Genus novum.)—Apothecia urceolata, excipulo proprio albido connivente discum rubrum submarginante, margine thallino evanido. Sporæ ellipsoideæ, incolores. Spermatia acicularia, arcuata, sterigmatibus subsimplicibus. Thallus crustaceus, effiguratus.

Urceolina Kergueliensis (sp. nova) thallo crustaceo adnato areolato-verrucoso aurantiaco-fuscescente, verrucis gibbosis centroque substipitatis in ambitum effiguratum coalescentibus; apotheciis (circ. 1 mm. lat.) immersis, margine proprio tenui pallido v. dein livido-nigrescente. Sporæ in thecis uniserialiter octonæ, simplices, limbatæ, 0,021–30$^{\text{mm.}}$ long., 0,015–20$^{\text{mm.}}$ crass., paraphysibus filiformibus. — Rocks. — Specimen scarcely two inches in diameter. Whole habit of the pale-ash-coloured young thalli that of similar thalli of Lecanora chlorophana; but the wart-like areoles becoming a little stalked, and the colour finally making as close as possible approach, in the brown series, to dirty-orange in the lemon-coloured. More or less radiation is evident in the arrangement of the warts towards the margin, which becomes lobulate, and the extreme edge blackish. Habit of apothecia that of Urceolaria scruposa with undeveloped thalline margin. The lichen is not referable to Lecanora § Aspicilia; and is excluded by its exciple from § Squamaria.

10. **Cladonia pyxidata,** (L.) Fr.—On the earth.

11. **Biatora rubella,** (Ehrh.) Rabenh.—Apothecia varying no little in colour and size, but all referable to the v. inundata, Nyl. (Hepp. Eur. n. 289) as that is represented in North America. Spores 0,030–46$^{mm.}$ long, and 0,0015–25$^{mm.}$ thick. Reaction of hymenial gelatine with iodine violet.

12. **Lecidea enteroleuca,** Fr.—On dead grasses.

13. **L. endochlora,** (Tayl. sub Urceolaria).—Rocks. (Herb. Tayl.)

14. **L. fusco-atra,** Ach., Fr.—Rocks.—And traces occur of three other Lecideæ.

15. **Buellia parasema,** (Ach.) Koerb.—Rocks.

16. **B. stellulata,** (Tayl.) Br. and Rostr.—Rocks.

17. **B. geographica,** (L.)—Rocks.

18. **Sagedia chlorotica,** (Ach.) Mass.—And there are insufficient traces of two other Verrucarieï. EDW. TUCKERMAN.

§ 56. **Valeriana sylvatica,** Richards.—Mr. Hoysradt has just sent me very complete and beautiful specimens of the *Valeriana sylvatica* he finds at Pine Plains. If, as I take it, the *Valeriana sylvatica*, described by Richardson from Northern British America, is the same as the plant of Western New York, Vermont and Michigan, these specimens are undoubtedly of that species, but of a most luxuriant form, with larger flowers as well as foliage and the radical leaves almost all toothed, incised, or divided. This is naturally associated with the luxuriance of the plant, and that, perhaps, with the lower latitude and low elevation in which this species is now unexpectedly found. The difficulty I encounter in the limitation of this species comes from the Rocky Mountain and more western form, with smaller flowers and mostly much simpler leaves, the radical ones almost always entire, the whole appearance of the plant nearly that of *V. dioica*, but the flowers not diœcious, or distinctly dimorphous, and the stigma nearly entire. A. GRAY.

October 19th.

[Mr. Hoysradt writes that he has found still another marsh where this plant is very abundant, with the same peculiarities, which attend the smaller as well as the more luxuriant plants. Of course "*Salix concolor*, Ging." in his note last month, § 48, was a misprint for "*Solea concolor*, Ging."]

§ 57. **Isaac H. Hall.**—This accomplished scholar, having been appointed professor of English in the Protestant College at Beirut, sailed for Syria about the 1st of September. In London he was very kindly received at the British Museum, and had the opportunity of comparing notes with Dr. Birch. Mr. Hall will now be able to study his favorite Shemitic languages in their home, and will be comparatively near to the Cypriote remains in deciphering which he has made himself a name; but the Club will miss a valuable member and the readers of the BULLETIN a welcome contributor. We hope, however, to receive communications from him, not only out of his store of observations on our own flora, but also in reference to the vegetation of his new home, where he will find Dr. Post and Mr. Wood, both New-Yorkers, to sympathize in his botanical tastes.

§ 58. **Increase A. Lapham.**—Dr. Lapham of Wisconsin, a well known botanist, died at Oconomowoc, in that State, on the 13th of

September. He was born in Palmyra, Wayne Co., N. Y., March 7th, 1811, and was conseqnently in the 65th year of his age. Dr. Lapham was better known in other scientific directions than in botany, to which, however, he did good service. *Laphamia*, Gray, a Western composite, was named in his honor.

§ 59. **Tetramerism in an Amaryllid.**—Some time ago (Bull., Vol. II., No. 7), I described a case of tetramerism in our familiar "Spiderwort" (*Tradescantia.*) Mr. Redfield, in the next number, reported a similar fact in the case of *Lilium auratum.* A very complete example of the same peculiarity was lately seen by me in another cultivated endogen,—the "pink lily," so called, which is perhaps only a garden variety of *Amaryllis* (*Zephyranthes*) *Atamasco.* During a visit to Trenton Falls, N. Y., I found, in the beautiful garden attached to Mr. Moore's hotel at that place, several plants of this species in flower. One of these flowers was perfectly tetramerous,—perianth eight-parted, stamens eight, and stigma fourcleft. The other flowers were all normal. D. S. M.

§ 60. **Publications.**—1. *Catalogue of Plants growing without cultivation within thirty miles of Amherst College*, by Edward Tuckerman, M. A., Professor of Botany, and Charles C. Frost, M. A. President Hitchcock's Catalogue was published as early as 1829. Prof. Tuckerman records his indebtedness in this new List to others and "not least to Rev. H. G. Jessup, who has recently gone over the larger part of the ground afresh, with unsurpassed care, and added a very considerable number of new things. It is to the same gentleman that the college owes the foundation and the building up of its new North American Herbarium." The preface contains a few precious statistics of the date of the appearance of certain common weeds. The catalogue itself is a model of its class for completeness and typographical excellence. It is divided into two series: the first, of 43 pages, contains the flowering plants; the second, of 54 pages, the flowerless plants; Equisetaceæ, Filices, Lycopidiaceæ, Musci (9 pages), Characeæ, 1 Alga, Lichenes (7 pages), Fungi (36 pages); the Lichenes, by Prof. Tuckerman, the other lower Cryptogams by Mr. Frost. There are of course many matters of general interest, such as, "*Calluna vulgaris*, Northfield, Frost.—2. *Catalogue of Paintings, Natural History, &c.*, of the Louisville Industrial Exposition, contains a list of thirty-one ferns native to Kentucky, arranged by John Williamson, among them *Asplenium Bradleyi.*—3. *Sixty-third Annual Catalogue of Hamilton College*, Clinton, N. Y., with tables of trees and shrubs which have or have not proved hardy in the College grounds.—4. The *Overland Monthly* for August contains some botanical notes of a popular character, especially in relation to the cultivation of Eucalyptus in the California marsh lands, by Dr. Wm. P. Gibbons.

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§ 61. **Notes upon Anychia dichotoma, Mx.**—Michaux proposed the genus *Anychia* in the Flora Bor. Am. (1802) and transferred to it the *Queria Canadensis*, L., changing the specific name to *dichotoma*. Under this name have been included two forms of quite diverse aspect. Nuttall, in his Genera (1818) first separated the more slender one, proposing for it the specific name of *Queria capillacea*, and indicated some of the distinctive characters. In this he was followed in the same year by Dr. Barton in the Compend. Floræ Philadelphicæ, who gives good diagnoses and calls *Q. capillacea* "a genuine and well marked species" but says that Dr. Muhlenberg "wished to see further" before accepting it. Dr. Torrey in the Flora of the Northern and Middle States makes *Anychia capillacea* to be *var. β.* of *A. dichotoma*, remarking that he was unable to discover any characters sufficient to distinguish the two. De Candolle in the Prodromus Vol. III. (1820) admits the two species as distinct, but adds that Dr. Torrey's view seemed to be confirmed by specimens received from him and from Dr. Bigelow. Nearly or quite all of the subsequent writers upon the Flora of the U. S. have followed Dr. Torrey, and in Gray's Manual the two forms are only recognized as varieties of one species.

How great may be the range of variation in other localities I am not able to say, nor whether the two forms are connected by intermediate links; but for the purpose of directing enquiry to this point, I take this occasion to say that the plants which I have seen and collected in this vicinity, have strongly impressed me with the idea that they belong to two valid species. The slender capillary form (*A. capillacea*, Nutt.) occurs on the wooded sides of deep ravines growing singly and scattered, with something of the aspect of an *Adiantum*. The other form I have found less frequently, and growing in close patches of considerable extent in more open level woods. So different is its appearance as well as its habit of growth that at first glance I had no suspicion of its relationship to the other. Close examination proved relationship but seemed to disprove identity. Compared with *A. capillacea* it is more pubescent, thicker and more robust in the stems and branches, shorter jointed, and of less height. Its leaves are more slender and lanceolete, its flowers numerous and crowded toward the ends of the branches, instead of being few and axillary, with the stipules at base of the flowers as long as the flowers. In addition to these points of difference, which have been previously noticed, I find that in my specimens of *A. capillacea* the persistent calyx is much shorter than the utricle (as shown in the figure in Gray's Genera), and is usually smooth and thin, becoming scarious towards the edges of the lobes. In the other form I find the calyx nearly or quite covering the utricle, and having its lobes thicker and more or less costate. The difference of station has been adduced as a cause of variation, but may it not as well be considered as evidence of diversity of species?

If further examination should result in retaining the two forms under one name, the law of priority would seem to require a return to Linnæus' specific name, making the name *Anychia Canadensis.*

Indeed, Wood in his Class Book, placing the plant in the genus *Paronychia*, calls it *Canadensis*, perhaps compelled to this by the fact that *Paronychia* already held a species *dichotoma*, quite another affair. But if the two species be distinct, as I am inclined to believe, it may be a matter of doubt as to which form is entitled to take the Linnæan name. But as Nuttall first discriminated between the two, it would be just to retain his name *A. capillacea* for the one, and to give the name *dichotoma* to the other, thus avoiding the doubt. JOHN H. REDFIELD.

Philadelphia, *Oct.* 22.

§ 62. **Pontederia cordata, L.**—A season or two back a clump of Pickerel-weeds engaged the attention of Mr. Hall and myself by an appearance of di- or trimorphism in the flowers, and we gathered a number of heads for examination at more leisure than we then had. It was, however, only late this autumn, too late to get fresh specimens, that I renewed my examination, and in the dried flowers I did not well make out what it was that struck us in the fresh ones, and unfortunately Mr. Hall is not here to give me the benefit of his recollection. H. Müller (*Befrucht. der Blum.* p. 62.) gives Kuhn (*Bot. Z.*, 1867, S. 67) as his authority for stating that *Monochora*, L., has cleistogamic flowers; and states that his brother has found in South Brazil two species of Pontederia probably trimorphic. I hope to resume the subject next season, but in the meantime wish to call attention to the result of the examination of the dried spikes, as it revealed some points of interest.

The spike of Pontederia is compound, the spikelets being arranged in the $\frac{1}{3}$ system common to endogens. The main spike begins to flower at the base, but, as the flowers of the spikelet develop successively, mature and immature flowers may be found all along the spike, when in full bloom, giving it its somewhat ragged appearance. There are three (or perhaps sometimes four) flowers in each spikelet, but to what extent they all develop I am in doubt.

In all the flowers which had matured and coiled up, I found the style as long at least as the longer stamens, but in all the other flowers, whether fully opened or apparently about opening, the style was intermediate in length between the two sets of stamens. This lengthening of the style as the flower matures occurs in other plants (for example Epiphegus, Menyanthes,) and in some cases might be explained by its partaking of the general growth of the pistil, but in this case and that of the sterile flowers of Epiphegus, this solution is not so satisfactory.

Of the six stamens, three on long and three on short filaments, I uniformly found the anther cells empty or nearly so in the fully opened flowers, but in those apparently nearly ready to expand the anthers seemed just mature and shedding their pollen, all the six equally. In the unopened flowers all the stamens held their heads erect, but in the opened flowers the shorter three uniformly had their anthers turned down. These unopened flowers seemed generally, if not always, the second one of the set on the spikelet, but I have not examined this sufficiently.

The most remarkable point noticed was the difference in the size of the pollen grains, those of the longer stamens being more than twice the diameter, or than eight times the mass, of the grains of the shorter stamens. Though minute these smaller grains seem as perfect as the larger, and in fact, if I am not greatly mistaken, in tearing the stigmas I more frequently found pollen tubes issuing from the smaller than from the larger, Still, as I was working with a simple dissecting microscope, I may be wrong about their being perfect. Both sets of anthers certainly drop their pollen about the same time and in the same manner, there being nothing of an appearance of immaturity in the lower. I do not know of another instance in which there is this difference of size in the pollen of the same flower, though, as Darwin has shown, in polymorphic plants there is a difference in the potency of the pollen ; and where there are two kinds of flowers on the same plant, the pollen of those constructed for self fertilization is possessed of "preternatural instinct and activity."*

In one of the rolled up flowers there was the wing of an insect, seeming to show attraction for insects.

Pontederia ripens but one seed, and the question forces itself on the attention, To what purpose this vast multitude of pollen grains, and of two sorts ? I did not succeed in finding pollen tubes in the style, and perhaps with my instrument should not have been able to distinguish them, though they were manifestly issuing from some grains taken from the stigmas. The floral organs including the style are beset with hairs or glands of a peculiar appearance, and the question presented itself to my friend Mr. Merriam (in the case of Lobelia) whether some of the excess of pollen grains may not be used in some way to nourish the pistil, exclusive of the extra number which it is now known are often required for direct fertilization through the stigma, or for attracting hungry insects.

My supply of the two other genera of this Order, native with us, *Heteranthera* and *Schollera* was too limited and imperfect to yield satisfactory results. Heteranthera gets its name from the striking difference in its anthers, and I thought I noticed a difference in the pollen, but wait for better specimens. W. H. L.

§ 63. **Coleanthus subtilis**, Siedel, or *Schmidtia utriculosa*, Sternb., is a rare little grass of very local occurrence and peculiar distribution. Steudel credits it only to Bohemia, but it has long been known in Norway. We have now received it at Cambridge from Mr. Joseph Howell, who collects it on Sauvier's Island in the Oregon River ! In attestation whereof I send a specimen to the Torrey Club, through its distinguished agrostological President, and ask that it may go to the Torrey Herbarium A. GRAY.

§ 64. **Publications.**—1. In *Nature*, Sept. 23, is a notice of a Report of the Neilgherry Loranthaceous parasites, in which Dr. Bidie, the author, is quoted as asserting that the Loranthaceæ (Mistletoes) "derive their nutriment not from the descending elaborated, but from the crude ascending sap of the host ; hence their need for green foliage containing chlorophyll and possessing stomata." "With reference to the mode of attachment between the parasite and the host, the author states that although very firmly attached, there is no actual interlacing of the tissues; and that in some instances, after maceration in water for a few days, the parasite could be separated from the host without much difficulty." This accords pretty well with the appearance of a fine section of *Phoradendron flavescens* and its host shown us by Dr. T. F. Allen.—2. Connecticut Valley Botanical Society. *The Springfield Republican*, October 12th, contains an account of an interesting meeting of this active Association at Mount Holyoke Seminary, October 6th, President W. S. Clark in the chair. Dr. Gray was present, and, among other things, explained why the keel of Apios tuberosa, Moench, is never coiled in an unvisited blossom, though coiled one turn after being rifled by bees; the tip at first being lodged in a little sac at the apex of the standard. The president spoke on the lifting power of plant-growth. He had seen a Black Birch in York, Me., which without doubt has lifted twenty tons of rock. Prof. C. H. Hitchcock, "the discoverer of the new flume in the White Mountains," sent specimens of Pinguicula vulgaris, L., discovered by him on Mt. Willard last July. Miss Hitchcock brought Asplenium Filix-femina, *var.* molle. Miss Shattuck reports Erythronium Americanum, Smith, as propagating itself chiefly by underground shoots, seldom flowering in that region. Thanks were voted to Prof. Tuckerman and Mr. Frost for the Catalogue of Amherst plants, and to the former for his liberality in the publication.—3. *American Journal of Science and Arts*, Nov. Dr. Gray has an article on Æstivation and its Terminology, and approves of the use of terms as follows: I. With some pieces of the set wholly exterior in the bud to others, *imbricate.* II. With each piece covered at one margin, and covering by the other, *convolute.* III. With each piece squarely abutting against its neighbors on either side, without overlapping, *valvate.* And a notice of W. T. Thistleton Dyer's *Classification and Sexual Reproduction of Thallophytes* with Sachs "relegating to the past, *Algæ, Fungi* and *Lichens*," as a classification.

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*Dr. Gray, as reported in proceedings of Conn. Valley Bot. Soc., Oct. 6th, 1875.

§ 65. **Character-Plants of Western Nicaragua.**—The uncultivated lands are mostly wooded, trees of the genera Bombax and Plumieria and of the orders Anonaceæ, Sapotaceæ, and sub-order Cæalpineæ largely preponderating. The shores of Lake Nicaragua are lined with a coarse species of Mahogany, the branches of which all grow to the south-west, accommodating themselves to the prevailing N. E. Trades. In the swamps, Crescentia is the most characteristic tree, in the dry season (with the exception of a few thorny Acacias) often the sole representative of vegetation. The undergrowth of the woods consists largely of Mimoseæ and Bromeliaceæ. By the road sides, Poinciana pulcherrima, Vinca rosea and other handsome Apocynaceæ abound.

C. F.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 66. **Epiphegus Virginiana**, Bart., Var. *Rauana*, Austin.—Differs as follows: Plant smaller, more slender, of a very pale almost pure white color throughout (very slightly tinged with yellow) becoming yellowish brown in herbarium; bracts a little longer and narrower, particularly the pair at the base of the calyx; pedicels longer (sometimes ½ inch or more long); calyx smaller and of a thinner texture, the teeth not keeled nor so broadly nerved; corolla more numerously and finely nerved, of a much thinner and more lax texture, the upper lip about 5 nerved, its apex much more vaulted and less broadly (until flattened out, indistinctly) notched, longer than the lower lip, teeth of the lower lip about one half as long and less complicate-keeled; stamens in pairs, barely didynamous, more exserted; stigma a little smaller; pod smaller; seeds a trifle narrower; the undeveloped corollas of the lower fertile flowers are much more narrowly conic; and it flowers two or three weeks earlier.—On the roots of the Beech, on the east side of High Peak, Catskill Mountains, Sept. 9th, 1875, about a hundred plants, more or less. On a three day's tramp we saw not a single plant of the typical form. RAU and AUSTIN.

EDITORIAL.—Mr. Austin is inclined to think his plant even more distinct than a mere variety. On the other hand, it appears to us merely a difference of form due mainly to premature and feebler development. We have found Epiphegus with the unopened flowers as early as the 19th of August and as far north as Hamilton Co., N. Y., and still more advanced in Morris Co., N. J., Sept. 1st. These earlier growths seem to us intermediate between Mr. Austin's and the common form.

Mr. Austin in his note speaks of an occasional malformation of the stamens, and we have found similar cases among our early flowering specimens. As the upper flowers seem to have lost their usefulness to the plant, we might expect them to show irregularities as a sign of degeneration, and, moreover, as the species itself seems to be entirely self-fertilizing, it is in accordance with theory that it should at length produce feebler forms, such as the present subject. The noting these forms affords valuable material for testing the theory. There are a number of our native plants which produce flowers of two sorts, the more showy of which are for the most part sterile, but particularly adapted to keep the vigor of the race by an occasional intercrossing. The study of these plants and a comparison of the various degrees to which the disuse has extended would be an interesting contribution to science.

Most plants have several modes of propagating themselves, two or more kinds of flowers, buds, rhizomes, etc., of which usually only one or two are used. But, if the reproductive energy is restricted in one direction, we generally find it expending itself in another. Thus a plant that spreads freely by its roots is sparing in blossoms, but may often be thrown into bloom by hindering the growth of the roots. Epiphegus seems to present an extreme case. While the pollen of the closed (cleistogamic) flowers is extraordinarily precocious and effective, there seem to be almost insuperable difficulties in the way of the fertilization of the open flowers. We have, indeed, found the capsule of one (an early flowering specimen ?) considerably enlarged and the flower falling off, but suspect that the fertilization was effected, before the flower was fully opened, by an accidental conjunction of the anther and stigma. And yet as the stamens are didynamous and the stigma at first protruding in advance of them and afterwards reflexed, the original plan would appear to be trimorphic. We hope to get further insight into this subject.

§ 67. **The cold of last winter.**—I have, during the past summer, made observations on the effects of the severity of the last winter on the trees and shrubs of the region between the Hudson and the Sound, as far as the Connecticut line. I have travelled in five different directions in distances ranging from seven to twelve miles. The Locust (Robinia Pseudacacia, L.) has suffered greatly. I have not seen any trees that are uninjured; some are entirely dead, others with dead tops. Even in groves containing more than a thousand trees every one is injured. I have also travelled along the shore of Long Island, immediately opposite, but did not notice a tree that had suffered. The foliage of our apple-trees has been small and of a pale sickly green, and fruit has been wanting. Two large specimens of Hibiscus Syriacus in my own inclosure, over twenty feet high and more than thirty years old, have died, and many smaller specimens in adjacent grounds were greatly injured or totally killed. Several varieties of Rhododendron which had heretofore been considered handy were destroyed. But the Coniferous Evergreens, so far as I have observed, have escaped injury.

White Plains. O. R. Willis.

§ 68. **Omphalaria pulvinata, Nyl.**—I send a specimen of this plant, recently gathered by me from the rocks at this place, and which Prof. Tuckerman writes me is new to the flora of North America.

Poughkeepsie, *Dec.* 17*th*. W. R. Gerard.

§ 69. **Fissidens hyalinus**, Wils. & Hook.—Dr. H. C. Beardslee, Painesville, Ohio, sends a specimen of this plant, one of the most rare and local of our Western Mosses, and writes: "The original locality near Cincinnati, where it was first discovered by the late Mr. T. G. Lea, is lost, and I am informed by Mr. Lesquereux that mine is the only locality now known."

§ 70. **Agaricus (Tricholoma) Peckii**, Howe, *n. sp.*—Pileus convex or expanded, viscid when moist, the separable pellicle when dry breaking up into small scales or areas, tawny red; flesh white; lamellæ narrow, close, sometimes branched, white; stem equal or slightly thickened at base, squamulose, white at the top, elsewhere colored like the pileus; odor farinaceous. Gregarious, 2—4 in. high, pileus 2—3 in. broad, stem 4—6 lines in diameter.

Ground in woods, Sandlake, N. Y., August. Young specimens sometimes have the top of the stem and the margin of the pileus adorned with drops of moisture of a reddish color.

Yonkers, N. Y. E. C. Howe.

§ 71. **Western Plants.**—I give you herewith some notes made on my trip from New York to Peoria and back via Mackinaw, Detroit, and the Great Western Railway of Canada, Buffalo, etc.—I saw in flower this side of Harrisburgh, Catalpa; and, west of Harrisburgh, Castanea vesca; also Sambucus pubens, abundant with ripe fruit; Pastinaca and Nuphar advena in flower, going up the Juniata; Solidago in flower, from the car window west of Pittsburgh; the two species of Melilotus also abundant. These and the following were noted on the ride through Central Ohio: Podophyllum abundant; Epilobium angustifolium, do.; Œnothera fruticosa common, in fine full flower; Nasturtium palustre, Calystegia sepium; Achillaea. In Illinois; Nymphæa odorata, in flower. While waiting for the next train at *Englewood*, 7 *miles South of Chicago*, *July* 3*d*, I found Silene antirrhina in full flower, and Anemone cylindrica. Potentilla anserina was abundant there and at Detroit, where it was in flower five weeks afterward. Scutellaria parvula was common and in flower, at Englewood, July 3d. Parthenium integrifolium not quite out. *At Peoria*, *July* 4*th:* Datura Stramonium was common and just come into flower; Verbena stricta was abundant and very showy, from Englewood to Peoria, having been in flower but a few days. Also, along the same route, the two species of Echinacea were seen, and the flowers of one were exceedingly abundant and showy. Verbena bracteosa was moderately common and nearly in full flower at Peoria; also a rather rare hybrid between these two species of Verbena. Mollugo grows larger and has larger flowers at Peoria than is common here. Echinospermum Lappula completely covers uncared for grounds in the city, and its odor perfumes the air in one's daily walks. Polanisia was abundant and just in flower at that date at Peoria. Martynia proboscidia is a common escope; Scutellaria vericolor was abundant with very fine flowers; Osmorrhiza longistylis was in full grown fruit; Paronychia dichotoma was common. *At Peoria, July 5th:* Aster Shortii not yet forming flower buds; Clematis Pitcheri abundant and beginning to flower; also Euphorbia dentata. Iodanthus hesperidoides, nearly in full flower; Tecoma radicans was abundant wild and beginning to flower. Yucca filamentosa is cultivated there, and was in flower; Hypericum sphærocarpon or nudiflorum was common, and nearly in full flower; also Silene stellata; Silene nivea was beginning to flower. *At Peoria, July 8th:* The fruit of Quercus imbricaria had $\frac{1}{6}$ of its full diameter, and leaves of Q. Leana were collected; Ruellia ciliosa abundant, had just come into flower; also Euphorbia corollota; Asclepias tuberosa was common and nearly in full flower; also Apocynum cannabinum; Psoralea floribunda was common, elegant and well in flower; Nasturtium sessiliflorum had full grown fruit; Lysimachia stricta had been previously noted abundant along the railway in Eastern Ohio. *At Peoria*, *July* 10*th:* Conobea and Psoralea Onobrychis were in flower and common. *At Peoria, July* 11*th:* Solanum Carolinense, common and well advanced toward full flower; Baptisia leucantha in flower, and 5½ feet high, was collected; also leaves of Asimina; Oxybathus nyctagineus was common and past mid flower. The flowers of Ceanothus Americana were just opening; those of Lythrum alatum were well advanced; also those of Alisma Plantago; Sagittaria variabilis was in full flower; Lysimachia ciliata was nearly full; Napæa dioica was just opening, and very tall; Onosmodium Carolinianum was just opening; Lippia nodiflora was in its early flowering stage; Rhus aromatica, common, was past flowering; Sylphium laciniatum was in the early stage; Silphium perfoliatum, six feet high, stem an inch in diameter and square, cup at perfoliation holding more than a gill; Asclepias verticillata, thick in patches, nearly in full flower; Coreopsis palmata, abundant in early flower; Potentilla arguta, common in full flower; Monarda fistulosa, abundant, in early flower; Euonymus atropurpureus, common, past mid-flower; Lepachys, just beginning to open; Linum sulcatum, in full flower; Heliopsis lævis, *Var.* scabra, in early flower; Petalostemon violaceus, common, opening flower season; Petalostemon candidus, common, just beginning to open; Echinodorus, two species, in flower. Some of these were obtained July 9th and 10th. *Peoria, July 12th:* Amorpha canescens, common in full flower. Hydrastis, leaf. *Peoria, July 16th:* Cacalia reniformis, common, not quite in full flower; Campanula Americana, common, in early flower. *Peoria, July 17th:* Cassia Chamæcrista, abundant, in early flower; Desmanthus brachylobus, abundant, well out; Cephalanthus, do., do.; Cassia Marilandica, early. *Peoria, July 19th:* Blephilia hirsuta, well out, common Zannichellia palustris and Batrachospermum moniliforme reported by Dr. Frederick Brendel. *Peoria, July 20th:* Liatris spicata, common, in full flower. *Peoria, July 22d:* Lobelia leptostachys, common, well out; Nelumbium luteum, abundant, in early flower; one leaf measured 29½ inches in diameter; Rhamnus lanceolatus, common, ripe berries; Elymus Europaeus, common, well out. *Peoria, July 25th:* Aster sericeus, abundant, not in flower; Senecio aureus, *Var.* Balsamitæ, passed fruiting; Lysimachia longifolia, common, in flower; Lysimachia lanceolata, common in flower. *Peoria, July 28th:* Hydrangea arborescens, common, in flower. *Peoria, July 30th:* Solanum heterodoxum, in flower, cultivated; Sida spinosa, abundant, in flower. *Chicago, Aug. 6th:* Silphium integrifolium, in early flower Gaura biennis, just opening; Cornus stolonifera, abundant flowers. *On Beaver Island,* a low, well wooded island in the Northern part of Lake Michigan, *Aug. 9th:* Trientalis, abundant; Lithospermum hirtum, nearly in full flower; Hypericum Kalmianum, ditto; Campanula rotundifolia, past mid-flower season, one specimen with leaves of all shades between the two types, and with those also; Cornus Canadensis, abundant, ripe fruit; Linnaea borealis, abundant; Sium latifolium in flower, specimen preserved; Vaccinium myrtifolium, abundant; Cassandra calyculata, abundant.

JAMES HYATT.

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§ 72. Vegetables cultivated by the American Indians.—I.

"*Some lived only by hunting; others had fields of waving corn, and raised also beans, pumpkins, tobacco, American hemp, and sunflowers.*" Higginson's "Young Folks' History of the United States," p. 14. Boston, 1875.

Similar statements are found in all our histories, and are derived from the accounts of the earliest European visitors that have left us their story. Yet the American origin of most of these plants has been disputed. Even A. De Candolle, who has discussed such questions with the greatest learning and ability (*Geog. Bot.*, Chap. IX.), is not convinced that this continent can lay claim to any of the cultivated Cucurbitaceæ. On the other hand, Asa Gray gives *Cucurbita ovifera*, L. ("the Orange-Gourd, Egg-Gourd, etc."), as "wild in Texas," and "probably the original of all this group," viz. *C. Pepo* (Pumpkin) [C. Pepo, α, L., C. maxima, Duch ?], *C. verrucosa*, L. ("Warty, Long neck, and Crook-neck Squash, Vegetable Marrow, etc.") *Field, Forest and Garden Botany*, New York, 1868. Dr. Gray, *ibidem*, agrees with De Candolle that *Lagenaria vulgaris*, Ser., (Bottle Gourd) is not a native.

In examining this question a remark of De Candolle's is noteworthy. In accounting for the potato in South Carolina, he says: "The voyage of Raleigh took place 95 years after the discovery of America. It is not impossible that the potato, now for a considerable time carried by the Spaniards from place to place, may have been recently introduced into North America by some unknown navigator, and the little diffusion of its culture among the aborigines, in particular towards the north, where it succeeds so well, would show that the introduction was not very ancient." As an illustration of such a possibility Champlain (*Voyages*, Paris, 1613, p. 7,) found in "l'isle de Sable . . . des herbages que pasturent des boeufs et des vaches que les Portugais y porterent il y a plus de 60 ans." Champlain, by the way, does not seem to be quoted by De Candolle.

One of De Candolle's difficulties in admitting the American origin of cultivated Cucurbits is the absence of native names. To meet this objection we applied to the eminent philologist, Dr. Trumbull of Hartford. His answer, which follows, not only removes that difficulty, but is rich in learning important to the subject.

HARTFORD, CONN., *Jan. 7th*, 1876.

* * * I could never discover *where the doubt came in*, as to the American origin of several well-known varieties of (to quote old Parkinson) "these Gourds, or Millions as some call them, or Pompions as I may call them."

First, for the northern varieties of "Squash." In the last edition of Webster's Dictionary, I gave briefly the origin and meaning of the name, and more fully in a note to my edition of Roger William's "Key," p. 125. It is *unquestionably* of Algonkin origin. The root, *asq*, denotes something *immature* or *not complete:* hence, it takes the two-fold meaning, *raw* (i. e. not cooked) and *green* (not ripe). It became the generic name of fruits and vegetables which might be eaten *green* or *raw*, and particularly of Cucurbits. The Indian plural of *asq*, in the Massachusetts dialect, is *asquash*.

Wood, in "New England's Prospect," published in 1634, says, that "in summer when their corne is spent, *Isquouter squashes* is their best bread, a fruit like a young Pumpion."

Roger Williams (l. c.) wrote in 1643: "*Askútasquash*, their vine apples, *which the English from them call* 'Squashes,' about the bignesse of apples, of several colours, a sweet, light, wholesome refreshing."

Eliot, in translating the Bible, puts *askootasq*, plural *askootasquash*, for "cucumbers," in Numbers xi., 5; *quonooasq* (literally, long-asq) for "gourd;" *monaskootasquash*, for "melons," etc.

Josselyn (N. E. Rarities, 57) says: "*Squashes* but more truly *squontersquashes*, a kind of melon, or rather gourd; for they often degenerate into gourds. . . . The yellow squash, called an apple squash (because like an apple) and about the bigness of a pome-water, is the best kind."

In England, the name 'squash' was understood to be of American origin. Robert Boyle mentions his experiment with the seed of "*squash*, which is an Indian kind of pompion that grows apace." (Works, i. 494.) But the name is not found, for any Cucurbit (or for any other fruit), in the earlier English herbalists—before 1650. It *is* used by Shakespeare for an immature pea-pod—perhaps so called because of its *emptiness*, (i. e. easy to be crushed, or, as we sometimes hear in the vulgar dialect of New England, to be *squashed;* a colloquial onomatopœia): or is it from the French *cosse*, an [empty] pod? The word is not, I think, to be found in any English dictionary before 1700.

Going South, we find, still earlier, two Virginia Cucurbits, with Indian names adopted by the English, and still in use: the *Macock* and the *Cushaw* (corrupted to "Kershaw.") Clusius (Exotic. l. ii. c. 2) describes the "*Macocqwer Virginiensium forte*," from a specimen sent him from London in 1591, which James Garet brought from "*Wingandecaow* Provincia, quam Angli *Virginiam* nuncuparunt." This specimen was hard shelled, orbiculate, about four inches diameter, the seeds flat and *heart shaped.* In the edition of 1605, he mentions the receipt of another specimen, which young John de Laet bought of a sailor at Amsterdam. Of the former, he says, "As it is reported to have come from Virginia, I readily pursuade myself that it is the same which the natives of that country call *Macocqwer*," etc.

Strachey, in his "Historie of Travaile into Virginia," 1610–12, describes this species: "The *macokos* is of the form of our pumpeons—I must confesse, nothing so good—'tis of a more waterish tast." "The inhabitants," he adds, "seethe a kind of *million*, which they put into their walnut-milke, and so make a kynd of toothsome meat." [This was, evidently, the rudimentary pumpkin-pie.] In the Indian vocabulary appended to Strachey's book, he gives: "*mahcawq*, a pumpeon."

Beverley (Hist. of Virginia, 124) describes the *Macocks* as "a sort of a Melopepones, or lesser sort of Pompion or Cashaw . . .

Squash, or *Squonter-Squash*, is their name among the northern (i. e. New England) Indians." . . These are summer squashes, "never eaten after they are ripe."

"The Virginian Macock or Pompion, ***Macocks*** Virginiani, sive Pepo Virginianus," is described in Johnson's Gerarde (1636) p. 919; and on p. 920, he figures "The small round Indian Pompion" and "The cornered Indian Pompion." The latter, from the figure, may be our common *scallop* squash. On page 921, he describes the Virginian *Water-melōn*, "melones aquatici edules"—from a specimen brought Oct. 10, 1621, by John Goodyer. The other species, he says, "are common in England," but the last described (the Watermelon) "is as yet a stranger."

The Virginian Cushaw (now "sometimes spelt Kershaw," according to Bartlett, who notes it as a "Western" name) was, I think, our old-fashioned winter Crook-neck. In Hariot's Virginia, the name is given as *Ecushaw*, which is probably the Virginian equivalent of the northern *asqua* and *asquash*, and of the modern Chippeway name of a squash or pumpkin, *agwissinan*. "These *Cushaws*," says Beverley (p. 124) "are a kind of Pumpion, of a blueish green color, streaked with white when they are fit for use. They are larger than the Pompions, and have a long, narrow neck." "The *Cushaws* and Pompions they lay by, which will keep several months good, after they are gathered." (p. 152.)

None of the North America species is described or named by Dodoens or his translator, Lyte, in 1578, nor in the excellent old Herbal of Jerome Bock (Hieron. Tragus), but the latter, in the edition of 1552 (pp. 834–836) describing the "Cucumis seu *Zucco* marinus," "oder *Indianisch* Oepffel," mentions it as one of the many species of foreign plants introduced, within the past few years, to Germany from distant countries. He distinguishes four sorts of "*Mala Indica*, Indianisch Oepffel"—Crocea, Lutea, Citrina, and Nigra. "The *Zucco marina*, as they are commonly called, because they first came *ex ultramarinis regionibus*, some from Syria and some from India, as their popular names testify, *Zucco de Syria* and *Zucco de Peru*," etc.

But I will not meddle with the Peruvian or the Mexican species. As regards North American varieties, the evidence seems conclusive. Three varieties at least still bear Indian names, which date from the first coming of Europeans, and of these varieties we have no mention before they were found in North America.

J. HAMMOND TRUMBULL.

§ 73. New or Little-known Ferns of the United States.
No. 4.

11. **Ophioglossum palmatum**, Plumier.—Frond cuneate at the base, sometimes entire, but commonly palmately 2–6-lobed, the lobes elongated and tapering; spikes 1–8 or more, borne on the sides of the stipe just below the lamina, or on the edges of the latter near its base. Plant 6–24 inches high, fleshy, epiphytic, oftenest on Palms. Rootstock fleshy, tuberous, covered with fine wool-like chaff, sending out many cord-like rootlets, and bearing on long

stalks one or several strange hand-like fronds, sometimes ten inches in spread, and with fingers nearly as long. The spikes are twice as large as those of *O. vulgatum*, and grow on the margin of both frond and stalk near their point of junction.

This very rare and curious Fern was first discovered by Charles Plumier growing on trees along the streamlet "Le Fond de Baudin" near Léogane in San Domingo, a century and three quarters ago, and was not met with a second time in his three voyages to the American Islands. It seems to have been next found in 1830 in the Mauritius, by Mons. Lepervanche Meyrien, and sent to Sir. W. J. Hooker, who figured it in Icones Plantarum (Vol. I, tab. IV.). Soon afterwards Mr. Tweedie found it in Southern Brazil, "growing in the axils of the leaves of a species of Palm." Later it was gathered at Chinantla, Mexico, by Galeotti; in Peru, by Poeppig—growing on trees in both places; on dead trunks at Tovar, Venezuela, by Moritz; and again, in Brazil, by Sellow; at Monte Verde and Rangel, in Cuba, by Charles Wright in 1858–'65; and in 1875 by the distinguished botanist of Florida, Dr. A. W. Chapman, "growing in the axils of the old leaves of the Palmetto in company with Polypodium aureum, only on one tree in deep shades, on the banks of the Caloosahatchee river in South Florida." Dr. Chapman's specimen's are not large, being about six inches high. They show some entire fronds, and others 3–4-lobed, and have from one to three spikes. This discovery in Florida of a most rare, and peculiarly tropical Fern, is another, and very interesting illustration of the relation of the Flora of Southern Florida to that of the Antilles. D. C. Eaton.

New Haven, January 3d, 1876.

§ 74. **Cyperus Wolfii**, n. sp.—Culmo triangulari, glabro, basi foliato; umbella simplici, subpente-radiata; radiis valde inæqualibus, monocephalis; capitulis rotundis, simplicibus, polystachyis; involucro subpentephyllo, foliis 2 elongato, vix culmo brevioribus; spicis capitato-congestis, oblongis, 4-5 floris, squamis imbricatis, obtusis, submucronatis, 11 nerviis, carina viridi; racheola late hyalino-alata; filamenta 3, deciduis; stylo trifido; achenio triangulari-obovato, apicato, incurvo.

Found by Mr. John Wolf in Anna, Ill. The culms are 2–3 feet high, but quite slender. The leaves nearly as long and quite narrow, those of the involucre about half as long. The spikes are 3″–6″ long, 3–6-flowered, finally a little brownish.

Apparently a clear species, in its general aspect resembling C. filiculmis, but nearest allied to C. Sieberi, Kunth, of New Holland. From C. filiculmis it differs in its teretish pointed spikelets, acute glumes, and winged rachis, long involucre &c. A. Wood.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M. Botanists are invited to attend. Dr. Thurber, *the President of the Club, may be found at 245 Broadway.*

§ 75. C. F. Austin on two New Musci.

Trichostomum (Trichodon) nodulosum.—Caule cæspitoso semiunciali et longiore erecto (sterili graciliore subflexuoso), foliis inferioribus subulato-lanceolatis canaliculatis subuniformi-areolatis, cellulis ovali- vel oblongo-quadratis in sectione transversali rotundis subseriatis, comalibus sensim majoribus e basi oblonga lineali-lanceolatis, perichætialibus intimis basi spathulato-oblonga ad ¾ et ultra vaginantibus, reti versus basin sensim duplo triplove longiore paulum latiore oblongo et oblongo-lineari stricto subsemipellucido, omnibus in statu siccato erectiusculis subtortuosis (in humido apertis strictioribus) lævissimis versus apicem subserratis margine (basi excepta) lamellato-incrassatis leniter recurvis, costa validiuscula percurrente instructis, capsula in pedicello fere unciam longo cylindracea oblongo-cylindraceave erecta in medio leniter curvula, calyptra ad sinistram subtorta infra medium capsulæ descendente, operculo alte conico conicove-rostrato leniter curvulo (sed non obliquo), annulo composito deciduo, peristomii dentibus 16 longis lenissime contortis lævissimis (haud granulosis) rufo-purpureis nitidis basi per paribus confluentibus (gemellis) fere ad basin in cruribus duobus æqualibus tenuissimis filiformibus acutissimis tota longitudine distinctissime (circa 10–15) nodoso-articulatis fissis (raro aut hic illic minus profunde fissis aut subconfluentibus): pl. masc. (semper ?) minima gracilis ad latus femineæ parasitica, flore minuto terminali. *Trichodon oblongus*, n. sp. Aust. in litt. ad Sulliv. Dec. 1868. *Trichodon oblongus*, LINDB. Trichost. Europ. 1864 p. 15 (adnot.), ab planta nostra differt: "foliis serrulatis, seta quadrilineari, subflexuosa, dentibus peristomii brevibus, cruribus irregulariter connatis subgranulosis, annulo simplici.—*Ceratodon Corsicus*, SCHIMP. Synop. p. 140, qui ad illam proxime accedere videtur, "capsula sicca vacua sulcata, peristomii dentibus valde granulosis submarginatis," sese distinguit.

On the perpendicular or inclined surface of damp or wet rocks in deep shaded ravines, Pascack, New Jersey (1868), and Suffern, New York (1869). Also at the mouth of "Buttermilk Ravine" in the Catskill Mountains (Rau & Austin, 1875). (Matures in Oct. and Nov.) [Only four fertile stems were found at Pascack, and the little tuft found at Suffern was sterile.]

Trichostomum nodulosum differs from its congeners in its perfectly smooth and shining peristomal teeth, usually divided nearly or quite to the base into two more slender and more finely and acutely attenuated segments, which are strongly nodulose throughout their whole length. The following are the only American species with which it would seem possible to confound it, with a brief view of some of the chief characters by which they severally may be distinguished:

T. tortile, Schrad. (which I have never found on rocks) is of a smaller size with a usually much smaller capsule on a shorter pedicel; peristomal teeth paler, much more twisted, stouter, papillose and obtusish; annulus simple and persistent; perichætial leaves with a lanceolate much more pellucid base, the innermost ones much dimin-

ished, and not at all vaginal; leaf-cells heteromorphous and not placed end to end, in cross-section *square*, the basal cells longer and more inflated, and very irregular in size; costa stouter (particularly at the base), etc.

T. lineare (Swartz) Sulliv. (*T. vaginans*, Sulliv.) has a small ovate-oval or -oblong capsule, with a shorter operculum, broader subpersistent annulus, straight (not twisted) granulose (Sulliv. *Icones* to the contrary notwithstanding) peristome, whose teeth are lancolate-subulate or subulate-lineal, subsimple, and more or less perforated, and less prominently nodulose; leaves much shorter, straight and appressed, with a longer (very narrow and close) areolation, and a broader and more depressed costa; the perichaetial ones more vaginal and convolute and much shorter pointed; it also grows exclusively on the ground.

T. heteromallum, Lindb. (*T. Sullivanti*, Aust. Ms., 1872.—*T. vaginans*, Sulliv. & Lesqx. Musc. Exsic. ed. 2, n. 154.) This fine and distinct species is nearest to *T. lineare*, and in size and general appearance somewhat intermediate between it and *T. tortile*. However, it is readily distinguished from the former by its rather longer and less appressed leaves, with much shorter cells and thicker interstices, and a narrower and more terete costa; and by its rather longer and narrower ovate or conic-cylindrical capsule, with a very narrow peristome, composed of nearly filiform, erect, parallel, almost always simple and entire, and still more faintly granulose teeth, and a narrower annulus. The perichætial leaves also differ in being rather less convolute, and in having a rather less abrupt, longer and more acute apex. This species occurs in great abundance along highways and by-ways in the White Mountain region of New Hampshire, extending into the mountains far above the limit of trees.

Syrrhopodon? Rauei, *n. sp*—Dioicus; flos masc. gemmiformis, versus apicem caulis lateralis sed non axillaris; caule procumbente subflexuoso simplici et subramoso, foliis e basi erecta subsemivaginanti ovato-lanceolata subpatentibus undique vergentibus leniter flexuosis siccitate paulum crispabilibus lineali-subulatis concavo-canaliculatis, margine plano lenissime incrassatove (rarissime anguste recurvo) inferne eroso ac superne subserrato, dorso versus apicem scabriusculo, costa valida limitibus supra inconspicuis percurrente lamellato-striatula, reti minutissimo opaco quadrato basilari (extremo excepto) vix aucto ad angulos cellulis multis (limitibus obscuris) duplo triplove majoribus ovalibus paulum inflatis demum subfuscis pellucidis instructo; colore atroviridi: pl. fem. ignota.

On shaded rocks in the mountains of Pennsylvania, "along Stony Brook," *Rau*, (Associated with *Jungermania albicans, var. taxifolia* and *J. setacea*.) Stems about an inch, and leaves $1\frac{1}{2}$–2 lines long; the latter usually rather suddenly narrowed $\frac{1}{5}$–$\frac{1}{3}$ way above the base into a subulate-lineal, thickish, deeply canaliculate (scarcely carinate) point, which is slightly scabrous and irregularly serrate above, and is chiefly occupied by the stout costa; the expanded portion is very minutely and obscurely erose-serrate above the middle. The plant is of an uncertain generic character; it may possibly be a *Didymodon*. The only moss known to me with which it would seem possible to comfound it is a form of *Dicranum fulvum*, Hook., which grows in precisely similar situations, is often of the same blackish green color, and otherwise presents a somewhat similar appearance; but that is always more robust, and has the leaves more crowded, usually nearly or quite twice as long, gradually tapering from a lanceolate more concave base, more crisped when dry, and less spreading when moist, margins never thickened nor recurved, and perfectly entire (always?) towards the base, areolation above nearly similar but towards the base more enlarged and oval, at the basal angles more inflated—the inflated patch more distinctly defined, costa a little stouter and less distinctly or not at all striate-lamellated, "male flower terminal," etc.

§ 76. **New Fungi found at New Field, New Jersey,** by J. B. Ellis.

(*Continued from Vol. V., No.* 11.)

9. **Agaricus** (Armillaria) **nardosmius,** *n. sp.*—On the ground in oak and pine woods, September, October. Pileus 3′ or more across, mottled brown—flesh firm, white, thick and compact in the disk but suddenly thinning out near the margin which on this account soon withers—cuticle thick, tough, separable—lamellae unequal, rather crowded, subventricose, attached, with a shallow sinus, about ⅓′ broad—stem solid, of fibrous texture, white within—sheathed below by the dark brown velvet-like veil which terminates above in a narrow, spreading, jagged-edged ring, fibrose-squamulose above, about 3′ long and ½′ thick, not bulbous. Spores subglobose, .00025′ in diameter.

The surface of the pileus is smooth to the touch and soft but variegated with patches of appressed hairs, which appear as if dried down upon it after having been wet. The fresh plant has an aromatic smell like spikenard. First observed in 1873, and found each season since in the same locality. The upper surface of the ring has a pale lilac tint.

10. **Agaricus** (Clytocybe) **auratocephalus** *n. sp.*—Pileus obtuse-conic, expanding to convex, with a fleshy umbo, surface smooth but of fibrous texture, and at length more or less rimose-striate. About 1½ inches broad—lamellae broad (¼′) ventricose, fleshy, subsinuate with a decurrent tooth, not crowded, becoming orange-red in drying—stem usually compressed and crooked, attenuate at both ends, hollow, smooth, brittle, as is the whole plant, 3′–4′ long, ¼′ thick. Spores about .0004′ long, short oblong, somewhat irregular in shape.

Gregarious and subcespitose, in swampy ground, July. Whole plant golden yellow, when fresh has a strong peculiar smell, especially when drying. The lamellae become glaucous pulverulent.

11. **Agaricus** (Entoloma) **indigoferus,** *n. sp.*—Pileus 3′–4′ across, convex-plane, rivulose, indigo blue fading out at length more or less, flesh white, very thin towards the margin—lamellae hardly crowded, sinuate emarginate, white, becoming flesh color, at length becoming ventricose and separating from the stem, which is solid, brittle, fibrillose, white, more or less tinged with blue, tomentose at base, 2′–3′ long, ¼′–½′ thick. Spores dull flesh color very irregular, .0004′.

Gregarious or subcespitose. Among moss in the swamp.

August. Distinguished from A. cyaneus, *Pk.*, by its larger size, smooth stem and rivulose pileus.

12. **Agaricus** (Collybia) **conigenoides**, *n. sp.*—On decaying fruit cones of Magnolia, August, September. Pileus thin carnose, convex-plane, ¼′ across or less, not umbonate, pellucid-striate, white, becoming yellowish, and like the slender stem, covered with a minute pubescence—lamellae free, *not crowded*, 9–12 entire, the others shorter, white becoming yellowish, margins pubescent. Stem slender, one inch long with a strigose rooting base, remaining white above for sometime. The pubescence of the lamellae is of a peculiar nature, consisting of narrowly elliptical bodies about .0015′ long and partly imbedded in the substance of the lamellae, but easily separating on carefully crushing a fragment on the slide of the microscope and floating out entirely free from the substance of the lamellae. These narrowly elliptic or fusiform bodies are of the same character as the pubescence on the hymenium of the Paxillus described in this paper. This may perhaps be considered as a mere var. of Ag. conigenus, ~~*Pk.*~~ Pers., but seems sufficiently distinct. I first observed it three years ago.

13. **Paxillus pubescens**, *n. sp.*—Pileus carnose, convex, covered with a brownish, rather thin and tough, smooth, separable, viscose cuticle, becoming dull red when dry, 1′–2′ across—flesh yellowish compact in the disk, thinning out abruptly towards the margin. Lamellae adnate decurrent, not crowded, with a few shorter ones around the margin, and covered like the interspaces with a short, erect, scattering, ark colored pubescence. Stem solid, rather attenuated below, surface fibrillose, squamulose above, 1½′ long, about ½′ thick.

Spores fusiform elliptic, olive-gray, about .0008′ long. In pine woods, subcespitose. Seen first, September, 1873—found again, October, 1875. A very peculiar fungus. On carefully crushing on the slide of the microscope a portion of the hymenium, the hairs, if they may so be called, appear like little cylinders about 02′ long, attenuated below and abruptly enlarged above. Lamellae dark blood red when dry.

14. **Marasmius cucullatus**, *n. sp.*—On dead twigs and limbs of Vaccinium ~~Viburnum~~ corymbosum, October. Pileus about 1-20 of an inch across, thin, campanulate, margin sulcate-striate and in the dry plant closing around the stem like a hood—lamellae about 12 with shorter ones alternating, adnate, rather paler than the pileus. Stem ¼′–½′ long, slender, with a spot of white tomentum at base—pale-straw color throughout. Grows on branches not yet fallen.

15. **Marasmius praeacutus**, *n. sp.*—On cedar twigs and on the bark of cedar trees and logs—summer and fall. Pileus membranaceous, convex and margin incurved at first but soon expanding to nearly plane, subumbilicate and faintly sulcate-striate, white with a reddish tinge in the centre, about ¼′ across.—lamellae hardly crowded, more or less branched, with a few shorter ones, adnate but not decurrent, white, rather narrow. Stem about one inch long, swollen below and hollow, but suddenly contracted at the very base almost to a point, color reddish-brown rather lighter above, the pointed base nearly white.

The young plant consists of a swollen *oblong-clavate* stem capped with the minute white pileus, which is then less than the diameter of the stem itself, but, as the pileus expands, the stem elongates and becomes more slender.

Near M. Vaillantii, *Fr.*, but the lamellae are closer and narrower, the pileus smaller, and the stem is contracted above and white at base.

16. **Boletus squamulosus,** *n. sp.*—Pileus convex, 2′–3′ across, covered with a dull red, separable, viscose pellicle—flesh soft, dull yellowish-white when freshly broken, soon turning greenish-blue and finally drying to a permanent yellow—tubes of unequal size, not large, somewhat depressed around the stem, straw color, turning greenish-blue when bruised, but, like the flesh of the pileus, becoming at length permanently yellow. Stem solid, 3′ long, ½′ thick, rather enlarged below, yellow within and at the very summit, surface covered, except the yellow summit, with a *red squamulose coat.* Resembles B. Frostii, *Rus.*, but distinguished by the color of the tubes and the different covering of the stem. Spores elliptic, about .0007′ long, one end a little bent. In dry oak and pine woods, July, August.

§ 77. **Two New Fungi,** by Charles H. Peck.

Lycoperdon Warnei, *Pk.*—Peridium large, three to four inches high and nearly as broad, sessile, thick, scaly, obovate, whitish; spores snuff-brown, subglobose inclining to ovate, .00025 to .0003 inch long.

Ground among nettles. Chicago. *H.* ~~*L.*~~ A *Warne.* Of this species I have seen dried specimens only, but so far as the characters can be ascertained, it is a remarkable plant differing from all ordinary forms of Lycoperdon in its peculiarly large spores and in its singular capillitium, which is made up of membranous plates or folds rather than of filaments. It may hereafter be deemed necessary to separate it as the type of a new genus. Mr. Warne remarks that in size and shape it is not unlike a beef's heart.

Septoria Besseyi, *Pk.*—Hypophyllous; perithecia more or less abundantly scattered over the whole lower surface of the leaf, slightly prominent, at first pale ferruginous or subochraceous, then black; spores large, cylindrical, obtuse, moderately curved, usually containing several nucleoli, .0016 to .0022 inch long, about .00016 inch broad, oozing out in whitish or pinkish white masses or in short thick tendrils. Living leaves of young ash trees. Ames, Iowa. *Prof. C. E. Bessey.*

This species is doubtless closely related to *Septoria Fraxini*, but it differs so much in habit, judging from the description of that species, that I have felt constrained to consider it distinct. The upper surface of the leaf is mottled with minute yellowish spots. Both this and the preceding species are dedicated to their respective discoverers.

§ 78. **New Fungi,** by W. R. Gerard. No. VI.

Hysterium Cookeianum, *n. sp.*—Perithecia erumpent, and at length entirely superficial, black, not striate, linear-elongated, ends acute; lips narrow, slightly swollen, edges somewhat remote; asci cylindrico-clavate; sporidia obovate, hyaline, endochrome fenestrate, .0009′—.001′ long.

On back of *Carya alba*, gregarious, lying on the matrix in all directions, and bearing a striking resemblance to some of the graphideous lichens. New Paltz Landing, 1875.

Hysterium versisporium, *n. sp.*—Perithecia scattered, minute, elliptical, smooth, black, shining, lips well rounded, closely connivent; sporidia variable, elongated-clavate, elliptical and ovoid, 1 to 3-septate, dilute brown, .0005′—.001′ long by .0002′ wide at the larger end. Young spoiridia hyaline. On decorticated oak.

Hysterium Gloniopsis, *n. sp.*—Gregarious, erumpent, elongated, straight or flexuous, tapering toward the ends, black, shining, with a few longitudinal striae; lips rounded, inflexed, forming a narrow aperture; asci cylindrico-clavate; sporidia bi-seriate, fusiform, hyaline, 3-septate, fenestrate, .0006′x.0002′ (at the thickest part). On Oak, New Jersey (Ellis No. 2,083).

Glonium simulans, *n. sp.*—Gregarious, superficial, linear oblong or subglobose, obtuse at the ends, whole surface marked with close, fine, longitudinal striae; lips closed, aperture scarcely visible; sporidia hyaline, fusiform lanceolate, slightly curved, uniseptate, swollen at the septum; one segment slightly larger than the other at the septum; each cell tri-nucleate. The spot on which the perithecia are seated is usually blackish.

On unknown wood, Poughkeepsie.

Peziza truncicomes, *n. sp.*—Sessile, cap-shaped; margin involute, scalloped; externally dead-white, pruinose; disk dark yellow (ochraceous); asci cylindrical; paraphyses filiform; sporidia oblong, .0006′ x .0004′

On rotting stumps in company with *Peziza repanda, Wahl,* cups about three-fourths of an inch across. Poughkeepsie, 1875.

Phyllosticta Quercus-rubrae, *n. sp.*—Epiphyllous; spots few, roundish or irregular, whitish, circumscribed by a red line; perithecia numerous, minute, globose, black, mostly aggregated in the centre of the spots; spores very minute, oval.

On leaves of *Quercus rubra*, September and October, Poughkeepsie.

Septoria Celti-gallæ, *n. sp.*—Spots none; perithecia very small, black, immersed, scattered; spores not seen.

On gall of leaves of *Celtis occidentalis*, New Paltz Landing.

Uromyces Pontederiæ, *Grev.* Vol. VI, p. 31, proved to be the previously described *U. Peltandræ* of Dr. Howe, a species that I had overlooked when I described mine.

§ 79. **Variation of Ferns.**—I am glad to see that Prof. Tuckerman in his list of Amherst plants throws out the so-called varieties, Onoclea sensibilis, *var.* obtusilobata; and Osmunda cinnamomea, *var.* frondosa. It would certainly seem that they are not "varieties" in the general acceptance of the term, as the plants which produce them one year, not only seldom produce them a second, but are more likely not to produce them again, at least I find it so In my herbarium I have the same thing (this half-way state between sterile and fertile fronds) occurring in almost every species which has dimorphous fronds, and in the following species, in a very pronounced form: Osmunda regalis, O. Claytoniana, O. cinnamomea; Lygodium palmatum; Struthiopteris Germanica; Onoclea sensibilis; Botrychium dissectum; Ophioglossum vulgatum—the last very marked; and in Woodwardia angustifolia to a considerable degree. If one is worthy of a name all are, but it would be much better to throw all out of the list of "varieties" and so save confusion.

Salem, Mass. JOHN ROBINSON.

§ 80. **Rhus Toxicodendron,** *L.*—On page 47, Vol. VI, of our BULLETIN it is said: "Rhus Texicodendron seems to prefer the Red Cedar, Locust, and Cherry, and to shun the Pine. Can any one gives us an account of its proclivities to other trees?" I have known this Poison Vine for years persistently climbing a Persimmon tree in the parsonage yard of the Reformed Church, at Keyport, N. J. I have for several years watched the habit of this vine among some Red Cedars, and trees of the Amelanchier Canadensis; invariably the Poison Vine avoided the latter, and clung to the former, even though two old trees, one of each species, so crowded each other, that there was not more than 12 inches between them.

SAMUEL LOCKWOOD.

§ 82. **Publications.**—1. *Botanical Bulletin*, Nov. 1875; Vol. I., No. 1. John M. Coulter, Hanover, Indiana. We have here the first number of a new botanical monthly after the model of our own. The four pages are handsomely printed, and contain interesting notes on *Gentiana quinqueflora*, Lam., *Querci near Hanover, Ind.*, *Aster Nova-Angliæ*, *L.*, *Certain species of the genus, Asplenium*, and a *List of plants collected in the Black Hills during the summer of* 1874. The price is the same as for our Bulletin. We wish the name had been different to avoid confusion. The editor remarks: "The New England States and New York are well supplied with such means of communication, but we do not doubt that there are many interesting finds and notes west of those States that are only waiting some such opportunity as this to be presented to the botanical world." So far as this implies that the BULLETIN OF THE TORREY BOTANICAL CLUB is not open to any communication of botanical interest from my part of the country, as far as its space allows, it is a misapprehension. The 2d and 3d Nos. keep well the promise of the 1st.—2. *The Black Spruce*, by Charles H. Peck, A. M., read before the Albany Institute, May 4th, 1875. A full and well written account of this useful and magnificent forest-tree, its varieties and the vegetable and the insect parasites that injure it, by the able botanist of the State of New York. This is the tree on which Arceuthobium grows. "The remarkable fact about this parasite is that thus far it has been detected on those spruces only which grow in swamps or on or around sphagnous marshes." This is a stunted form. "It has not yet been seen on the typical forest spruce." "The Arceuthobium is now known to occur in five counties of the State."—3. *Existe-t-il dans la Vegetation actuelle des Caracteres generaux et distinctifs qui permettraient de la reconnoitre en tous Pays si elle devenait fossile?* A. De Candolle. Arch. des Sci. de la Bibl. Univ., Dec. 1875. In this article, the confusion in the two senses of the word *Epoch*, astronomical and geological, is pointed out, the former being necessarily contemporaneous but the latter not; the epoch of Compositæ, for example, in South America not being simultaneous with a similar development in Southern Asia. —4. *Sur les causes de l' inégale distribution des plantes rares dans la chaine des Alpes*, by A. De Candolle, Florence, 1875. The general conclusion at which the author arrives is that: "The valleys and the groups of mountains which present the greatest number of rare species and the most varied flora belong to the districts in which the snow and the glaciers have had the shortest duration. On the other hand the districts poor in their flora are those in which the influence of the snows and of the glaciers has been the most prolonged." —5. *Botanical contributions*, by Asa Gray, Proc. Am. Acad. Arts and Sci. Vol. XI., issued Jan. 5th, 1876, "relating mainly to Californian botany, the writer having been engaged in the preparation of the *Gamopetalæ* for Professor Brewer's Botany of California now printing." But the first note has reference to two plants of the Atlantic United States which have long been confounded, viz., *Sedum pusillum*, Mchx., and *Dimorpha pusilla*, Nutt., both found on Stone Mt., Geo. *Palmerella* is a new genus of Lobeliaceæ, differing particularly in the adnation of its stamens. We can only refer to other new genera and species discovered particularly by Dr. Palmer and in Gaudalupe Island, off Lower California. There is a conspectus of the American species of *Specularia*, and also of *Mimulus* and *Collinsia*. It seems that that our four species of Specularia "may be well distinguished from the European, and into two sections, by taking account of the cleistogamous flowers, which are regularly produced in our species, and not in those of the Old World."—6. *The American Naturalist*, Jan. and Feb. If any naturalist was dissatisfied with this excellent publication before, certainly in its present more enlarged form and more general information it should be a welcome visitor to every intelligent household. The botanist will find much gratification in Dr. Gray's "Burs in the Borage Family" and in the General Notes.—7. In the *American Agriculturist* for 1876, Dr. Gray contributes a series of articles, with illustrations, showing how flowers are (or may be) fertilized. Many matters formerly obscure are here cleared up.—8. In the *American Journal of Science and Arts*, see, in particular, the notice, in the Feb. No., of "Naudin on the Nature of Heredity and Variability in Plants." —9. *Field and Forest* for Dec., 1875, contains a study of the Tulip-tree by Robert Ridgway.—10. *Proceedings of the Poughkeepsie Society of Nat. Sci.* Vol. I., fasc. 1., contains a paper by W. R. Gerard on White Mildews or Blights, illustrated.—11. First Annual Report of the Chicago Botanical Garden.—12. *American Journal of Microscopy*, Vol. I., No. 2, Jan. 1876, McAllister, 49 Nassau St., N. Y.

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§ 83. **Some rare Southern plants.**—I wish to place upon record the history and localities of some few Southern plants which are extremely rare and limited in range, so that in the future they may not be lost to botanists. Some of them have been seen and collected only by myself, and are confined to single localities so far as yet known.

Eryngium praealtum, *Gray.* (In ~~first~~ Foot note to Plantæ Lindheimerianæ, Part II., Boston Journal of Natural History, Vol. VI., No. 11, p. 210, Jan., 1850).—This is the plant described in Elliott's Sketches as *E. Virginianum*, Lam. Grows in tide lands of Cooper River, rice fields, banks, etc.; also near Bluffton, S. C.; and as low down as Darien, Ga.

Eryngium Ravenelii, *Gray.* (Plantæ Lindheimerianæ, l. c., p. 209).—Grows in flat damp Pine land on the head waters of Cooper River, on road leading from Monck's Corner Station, on North-Eastern Railroad, to Stoney Landing, on Cooper River, and about midway between the two places. At this spot I found a large patch of this plant along the roadside in the wet Pine wood; a few specimens have been found a few miles further north, in a similar situation. This is the only locality where it has been seen as far as I am aware.

Baptisia stipulacea, *Ravenel.* (In Proceedings of Elliott Society of Charleston, June, 1856).—I have found this plant sparingly disseminated in the poor Sand-hill region in the vicinity of Aiken, and within a mile or two of the town.

Baptisia Serenae, *Curtis.* Dr. Curtis described this species from a few specimens found near Society Hill in this State on the same range of Sand-hills on which Aiken is situated. I have found only a single specimen here. These two Baptisias are very rare, whilst *B. perfoliata* is quite abundant all through the Sand-hill region.

Elliottia racemosa, *Muhl.* This plant, which has so far eluded all efforts to procure fruit, is yet very rare. Elliott says it was first discovered near Waynesborough, Burke Co., Ga., and afterward sent from the region of the Oconee. In company with Mr. P. J. Berckmans, of Augusta, Ga., I have for two seasons past visited a patch of it growing about ten or twelve miles west of Augusta in the Sand-hill region. On my first visit in September, 1874, we found a large number of the bushes covering perhaps an acre or more, varying from four or five to ten feet in height. The old flowering stems were still remaining, but not a capsule had been formed. In July, 1875, we again visited the place and found the bloom just over (some few flowers yet remaining) but not a capsule formed. The plants had rather a stunted growth from the poverty of the soil and appeared to be offshoots from old roots. The question naturally arises, What is the cause of the sterility, and the change of condition since the period when it must have been propagated by seed?

Carya myristicaeformis, *Mchx* —Michaux described this Hickory from specimens brought to him from the swamps of Goose Creek, about fifteen or twenty miles from Charleston. Elliott never saw the plant but inserted it in his "Sketches" on Michaux's authority. Many years ago I found several trees growing in swamps of head waters of Cooper River, not far from Black Oak on the Santee Canal. I have also received nuts taken from a tree on Cooper River. It seems to be rare and quite limited in range.

Quercus Georgiana, *Curtis.*—In 1848, whilst on a visit to Stone Mountain, Ga., I found this Oak growing abundantly along the road up the mountain. It is rather bushy in habit, and not exceeding eight to ten feet in height. The species was described and named from my specimens, and I have never heard of its being found elsewhere.

Eriocaulon Ravenelii, *Chapman.*—This species was described by Dr. Chapman in his Flora of the Southern States, from specimens collected by me, many years ago near Pinopolis, a small village, not far from Monck's Corner on the North-Eastern Railroad, and about thirty miles north of Charleston. Like its congeners this was found in low, wet, grassy places. I have never been able to procure any more of it, and the only specimens are those sent to Prof. Gray and Dr. Chapman, besides those in my own herbarium. It would probably be overlooked for the more common *Lachnocaulon Michauxii.*

Cyperus Iria, *L.*—This Cyperus (probably introduced) is found in damp roadsides and ditches about the neighborhood of Black Oak in St. Johns, Berkeley. I have also seen it on the road not far from Charleston.

Nitella praelonga, *A. Braun.*—I found this plant, in 18~~75~~51, growing submerged in the old Santee Canal, some two or three miles above Black Oak. It was sent to Dr. Engelmann and by him forwarded to Prof. Braun, who described and named it as above. The locality is now lost, as the old Santee Canal (cut nearly one hundred years ago to connect the Santee and Cooper rivers) has been abandoned since the opening of the North-Eastern Railroad. It may possibly be found in still waters in the vicinity. My specimens were collected in June, when in bloom.

AIKEN, S. C. H. W. RAVENEL

§ 84. Dr. Torrey's First Trip to the Pines.

The members of the Torrey Botanical Club and the readers of its BULLETIN will be interested, we are sure, in the following characteristic letter, the original of which is in possession of the Academy of Natural Sciences of Philadelphia. It was written by Dr. Torrey in his 22d year, just after he had prepared for publication his Catalogue of the Plants of the vicinity of New York. In connection with Dr. Torrey's remarks upon the original locality of the Schizæa, it is not amiss to state that with the specimens of that fern in the Herbarium of the Lyceum of Natural History, are the following notes, the first in the hand-writing of Dr. Torrey—the second in that of the lamented Wm. Cooper:

"First discovered by Dr. C. W. Eddy, near Quaker Bridge, in the pine-barrens of New Jersey, about fifty miles from Philadelphia. Dr. E. was in company with J. Leconte, Pursh and C. Whitlow, and though he and Mr. Leconte found all the specimens, Pursh has claimed the honor of the discovery himself. TORREY and COOPER, 1818."

"First found in 1805 *; not found again till detected by me in company with Dr. Torrey, in June, 1818. COOPER."

J. H. R.

NEW YORK, *July 9th*, 1818.

DEAR SIR:

We arrived at S. Amboy one week after we left Philadelphia, and, although our journey was rather an arduous one, we think ourselves well rewarded for all the privations we endured. The principal difficulty we experienced was in keeping the right road. Hundreds of these little roads cross each other in every direction like a labyrinth, so that it is next to a miracle if you hit the right one. We remained two days at Thompson's Tavern, where we were very [well] entertained. About this time we found a [consider]able number of plants which were new to us, indeed there were few plants but what we found here. The Drosera filiformis and foliosa? Ell. were abundant, as well as two species of Utricularia, one of which does not appear to be described. What pleased us more than any plant we found was the Schizæa. Cooper found the first specimen. It is a singular little plant and I first doubted whether Pursh had referred it to the right genus, but subsequent examination has convinced me that he is right. The whole of the plant which we saw was confined to a very small space. There is a small patch of it about forty-five yards from the W. end of the bridge, on the left side as you approach it from Philadelphia, and about twelve feet from the road. I have been particular to mention its locality as this is the only spot where we found [it.] We found abundance of the Leiophyllum and Hudsonia, some of them in flower. The latter plant I am inclined to think is a different species from the one which grows on the sea coast. At first sight you are struck with the long peduncled flowers of the one, and the almost sessile flowers of the other. We found two species of Eriocanlon; one common, tall and with large hemispherical head and tuft of short leaves at the base; the other smaller, with long leaves. They are both ten-striate.

After we had left Quaker Bridge we fared pretty hard. Some places called *Taverns* that we put up at were not fit for an Arab. At a place called the Ten-mile Hollow or Hell-hollow we expected to sleep in the woods, for it was with difficulty that we persuaded them to take us in. This was the most miserable place we ever saw; they were too poor to use candles. No butter, sugar, etc. A little sour stuff, which I believe they called rye bread, but which was half sawdust, and a little warm water and molasses, were all we had for breakfast. For supper I could not see what we had, for we ate in the dark. From this place until we reached Monmouth we found scarcely a single plant in flower.

We found near Philadelphia a species of Plantago which may be new. It is not described in Persoon but it may be the P. linearifolia of Muhl. Cat. 2d ed. I shall send you specimens of it together with most of the plants we collected in our journey. I hope you will indulge me if I trouble you in this way once in a while.

---

* A letter of Dr. Muhlenberg's to Z. Collins, dated 1812, says "discovered last year by Mr. Pursh and Dr. Eddy" from which Mr. Redfield concludes that the date, 1805, is too early, but a comparison of Pursh's preface inclines us to accept Cooper's statement.—EDS.

I remain Sir, with the greatest respect, etc., yours,

John Torrey.

If there is any young botanist in your society that would be willing to commence botanical correspondence and exchange of specimens with me, I should be very glad to commence one immediately.

To Zaccheus Collins, Esq., Philadelphia.

§ 85. **Acanthospermum xanthoides,** *DC.*—This plant was discovered in Atlanta, Ga., last Summer, by Mr. T. B. Goulding, an active botanist of that city. It was growing in fields and waysides, thoroughly established. It is native in the West Indies, but nowhere recorded as spontaneous in the United States.

Clerodendrum Siphonanthus, *R. Br.*—This splendid plant is sent us from Macon, Ga., by Dr. G. M. Green. He reports that it has propagated itself in and around the gardens of Macon for several years past, no one knowing its name or whence it came. It is a tall perennial, with oblong entire leaves, flowers in whorled cymes, with cup-shaped purple calyx, yellow-orange tubular funnel-form corolla 5′ or 6′ in length, and long-exserted stamens (4) and style. It is a member of the Order Verbenaceæ, and native in the East Indies.

A. Wood.

§ 86. **Clitoria Mariana,** *L.*—In the Flora of the State, Dr. Torrey records this beautiful plant as growing "on sandy soil on a bushy hill-side about half a mile from the South Ferry, Brooklyn." This locality has long been swallowed up in the city, and botanists have in vain searched the neighboring parts of Long Island for another. We are happy to report that it may still be found in the vicinity of New York, though in another State. September 23d, 1871, we explored with a friend Little Snake Hill, an insulated knoll of trap, in the midst of the Hackensack flats and difficult of access. We found there *Solidago rigida*, L., and the beautiful grass, *Muhlenbergia capillaris*, Kunth (Bull. Vol. II., § 68), and an upright bean-like plant, in fruit, which we carelessly put away as *Phaseolus perennis*, Walt. We were unacquainted at that time with the fruit of this Phaseolus and that of Clitoria. Recently consulting Dr. Gray about this extraordinary Phaseolus we were kindly set right. This locality in our Catalogue, therefore, needs to be corrected. There was a considerable number of plants in one spot. We trust that those who seek it there will gather it sparingly and help to preserve it from extermination. Dr. Torrey describes the seed, "the size of small peas, covered with a glutinous kind of varnish, brown, the hilum small and roundish." The seeds in our herbarium seem as glutinous as when they were gathered more than four years ago.

Erratum.—§ 77, for "H. L. Warne," read "H. A. Warne."

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Vol. VI, No. 16.] **Bulletin of the Torrey Botanical Club.** [New York, Apr., 1876.

§ 87. Notes and Criticisms on Hepaticæ Americanæ Exsiccatæ,

by C. F. Austin.

No. 6. Plagiochila macrostoma, **Sulliv.**=Pl. interrupta, **Nees**; an older name.—As **Lindberg** has recently shown (*Act. Soc. Sci. Fen.* X. p. 504) this plant is hardly a *Plagiochila* but is nearer to *Lophocolea* and *Chiloscyphus*, and somewhat intermediate between them. But, as it does not fit well in either, he proposes to make a new genus, *Pedinophyllum*, **Lindb.** of it.

No. 15. Scapania compacta, **Roth.**(=Sc. resupinata, (**Dill.**) **Linn.**) var. irrigua.—This plant is abundant about the "Lakes" on the Catskill Mountains. The *Var. curta* (Scapania curta, **Nees.**) also occurs there. There is a small form of *Sc. nemorosa*, the stems always mixed with those of larger size, which resembles this form of *Sc. compacta* very much, but is readily distinguished by its areolation being like that of all the forms of *Sc. nemorosa*, and unlike that of any form of *Sc. compacta*. (vid. *Hook. Brit. Jung.*, *t.* 21, ff. 17, 18 & 19.) *Sc. brevicaulis*, **Tayl.**, is also a form of this species.

No. 19. Scapania Bolanderi, **Aust.**=*Sc. caudata*, **Tayl.** *in Herb.!* I do not know whether the plant has or has not been published under this name.

No. 20. Scapania Peckii, **Aust.**=Sc. glaucocephala, (**Tayl.**) **Aust.**, =*Jungermannia glaucocephala*, **Tayl.** (*Lond. Jour. Bot.*, 1846, p. 277)!

No. 26, is not a *Southbya*. It is near. *Jung. hyalina*, but apparently a distinct species. It is also closely related to *Jung. obovata*.

No. 27. Jungermannia Schraderi, **Mart.**—Add, as a synonym, *J. subapicalis*, **Nees.**

No. 29 Jungermannia sphærocarpa, **Hook.**—It is probable that *J. nana*, **Nees**, is a synonym.

No. 29, b. J. sphærocarpa, var.?, is very near *J. hyalina* and probably a form of it.=*J. ulignosa*, **Aust.** Mss. (1865.)

No. 30. Jungermannia crenulata, **Smith.**—The *Var. gracillima*, **Hook.**, (J. Genthiana, **Nees**) occurs near Closter, with the usual form and passing into it! Certainly not a proper species.

No. 31. Jungermannia crenuliformis, **Aust.**—Dr. **Lindberg** (*Act. Soc. Sci. Fen.*, X. p. 530) expresses a notion that this may be only a var. or "subspecies" of *J. crenulata*. However, it is a very distinct species! Both plants are abundant about Closter; the former always on shaded rocks in mountain rivulets; the latter always on the ground in old fields and on road-side banks. They differ very decidedly in the texture and position of the leaves and in their shape when dry; also in the texture of the colesulas, &c.

No. 35. Jungermannia inflata, Var. fluitans, **Nees.** = Jungermannia (Cephalozia) Francisci, **Hook.**, *Var. fluitans*, **Aust.**=J. inflata, *Var. δ*, *fluitans*, **Nees** (*Hepat. Europ.* II. p. 43, &c.)=*Cephalozia obtusiloba*, **Lindb.** (*Bot. Not.*, 1872, p. 164.)=*C. cladorrhizans*, **Geo. Stabler** in litt. Jan. 1, 1876.=*C. fluitans*, **Aust.** Mss. (=No. 581 of **Gott & Rabenh.** Exsicc.!). The "*Var. β*, 4†, *flagellifera*, of *Synop. Hepat.* p. 106, (vide adnot.,) also belongs to *J. Francisci*, no doubt. No form of *J. inflata* has ventral flagella (or branches)!

§ 88. Vegetables cultivated by the American Indians.—II.

Our first article was intended to prove the existence of aboriginal names for several varieties of cucurbitaceous plants. In the present we quote several authorities showing through what extent of territory the knowledge particulary of these plants and of beans had extended before the coming of Europeans. For what is of value in both we are chiefly indebted to the learning and kindness of Dr. J. E. Trumbull, of Hartford.

Cabaça de Vaca landed in Florida in 1528. Near Tampa Bay he found "maize, beans, and pumpkins, in great plenty." In his travel westward through Texas, the Indians supplied him with prickly pears and, occasionally, maize ; but after crossing "a great river coming from the north"—which seems to be the Rio Grande —he came into a country whose "inhabitants lived on maize, *beans*, and *pumpkins*."

On Cartier's first visit to Canada, 1534, he found, everywhere, maize—"mil gros comme poix, pareil a celui qui croit au Bresil, dont ils magent au lieu de pain,"—and "ils ont aussi des febues (fêves) qu'ils nomment *Sahu*." The vocabulary appended to the relation of his voyage gives "*casconada*" as the Indian name for "the seeds of *concombres* or *melons*." In the "Brief Relation" of his second voyage, 1535-36, mention is made of the use of maize by the Indians, "et de *febues* et poix, desquels ils ont assez, et aussi gros *concombres* et aultres fruicts. Further up the St. Lawrence, the Indians brought him presents of maize ("gros mil") and "*several great melons*."

Hudson, 1609, when anchored off the Catskills, bought "ears of Indian corn, pumpkins, and tobacco, and two days after, Sept. 18th, (*Brodhead* p. 30) saw in a house "a great quantity of maize or Indian corn, and beans of the last year's growth; and there lay near the house for the purpose of drying, enough to load three ships, besides what was growing in the fields.

In Champlains narrative of his earlier voyages (1604–1611), as reprinted in his final edition of 1632, he says that when coasting eastward from the River Quinibequey (Kennebec), he saw the Indians planting their "bleds d'Inde;" and that "in every hill they put four Brasilian beans ("*febves de Bresil*"), which grow of divers colors. As these grow high, they *wind about* ("s'entrelacent autour") the corn, which rises to the height of five or six feet, and keep the field clear of weeds."* "We saw also abundance of *citroüilles*, *courges*, and tobacco, which they cultivate" (p. 73). Southward, after passing Cape Blanc (Cape Cod), near the port of Mallebarre, he saw fields of Indian corn in flower, and "plenty of Brasilian beans (fêves de Bresil), and of *citroüilles* of several sizes, good to eat (p. 84). At one place the Indians brought him "little citroüilles, the size of one's fist, which we eat in a salad, like cucumbers, and found excellent; and *purslane* (pourpié) also, which grows plentifully among the Indian corn, and of which the savages make no more account than if it were a noxious weed!" (p. 80.)

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* If this was the Phaseolus vulgaris, it had not yet degenerated to *nanus*.—J. H. T.

Torrey & Gray think Purslane introduced, though possibly indigenous on the Missouri. Prof. Tuckerman, in a note to Josselyn, p. 81 (51 orig.). says of "Wild Purcelaine" (Portulaca oleracea, L.): "Considered to have been introduced here; but our author enables us to carry back the date of its introduction, without reasonable doubt to the first settlement of the country." Prof. Tuckerman puts a certain confidence in Josselyn's botanical knowledge, which he finds difficult to extend to the earlier writers. But in the case of so marked, and to us at least so familiar, a plant as Purslane, we may perhaps accept the repeated testimony to its abundant presence at a very early period. Champlain was half a century before Josselyn; and so was Strachey in Virginia, who names "purselin" among the herbs dispersed through the woods, good for broths and salads" (*Travaile into Virginia*, p. 120). Sagard also, in 1623 or '24, found the "pourpier, on pourceleine" in the country of the Hurons, and remarked that they made "tres peu d'estat" of it, though it grew "naturellement dans leurs champs labourez, parmy le bled et les citroüilles" (Hist. du Canada, 782).

As regards the Indian cultivation of beans, it is impossible from the description given by explorers in the 16th century to identify varieties or species, and there exist no wild species in the Eastern United States which would seem to answer the description. It is certain, however, that early in that century, beans were cultivated as far north as the St. Lawrence, that the varieties of American beans observed by the early voyagers (before 1600) were regarded as "proper to the country," and that they were so regarded by the botanists of Europe (e. g. Clusius, and Lobel); that the northern Algonquins of New England and the Middle States had at least one, and probably two varieties of climbing (pole) beans. A Massachusetts name for beans was *tuppuhquamash*, and the corresponding Abnaki, *a'teba'kouar*,—both apparently derived from a verb meaning 'to twine,' 'to wind about,' and thereby characterizing the plants as climbers. Prof. Tuckerman is inclined to think that Josselyn has mainly in view *Phaseolus vulgaris*, L. (*Joss.* p. 89, 59 orig.), a plant whose origin is unknown, "but for which in the West Indies we have old authority (see Gerard's Herbal, late editions), and De Soto (1542) speaks of the "kidney beans cultivated by the aboriginals of Florida "(*Pickering's Races of Man*, p. 396)," (Tuckerman in lit.) Dr. Trumbull thinks the American bean figured and described by Cornuti, pp. 184, 5 could not have been P. multiflorus, L., as the seeds were "subrotundi et nigri."

§ 89. **Publications.**—1. *Contributions to American Botany, VI.*, by Sereno Watson, from the Proc. Am. Acad., Vol. XI., Feb. 1876. I. On the Flora of Guadalupe Island, Lower California. This island in lat. 29° north, and about one hundred miles from the coast of Lower California, is now overrun by goats. What is left of its flora, as appears from the collections made with great exertion by the indefatigable Dr. Palmer, points to a flora similar to that of California. . . . and the presence of many South American types suggests some other connection between these distant regions than now exists, and even that the peculiarities of the western flora of both continents had a common origin in an ancient flora which prevailed over a wide and now submerged area. II. List of a collection of Plants from Guadalupe Island, made by Dr. Edward Palmer, with his Notes. III. Descriptions of New Species of Plants, chiefly Californian, with Revisions of certain Genera, viz.: Trifolium, 39 species; Lathyrus, 13 species; Megarrhiza, 5 species; Peucedanum, 20 species.—2. *The American Naturalist*, April, contains among its botanical matter Mr. Watson's contribution on the flora of Guadalupe Island mentioned above, and the results of Mr. L. H. Ward's investigations of the eccentricity of the pith of Rhus Toxicodendron, (Vid. BULLETIN, VI., p. 47). Mr. Ward concludes that there is a relation between the thickening of the stem and the development of the rootlets. He does not seem to have studied Ampelopsis.—3. In the *American Journal of Science and Arts* for March are a number of interesting notices by Dr. Gray, e. g. of Dr. Engelmann's Notes on Agave, of Duval-Jouve's Structure of the leaves of Grasses, Gymnocladus in China, Das Haustorium der Loranthaceen. The writer of the latter states that the vascular bundles of the parasites communicate with those of the plants on which they are growing. *Pilostyles Thurberi*, A Gray, must be an interesting study.—4. Harvard University has issued its Prospectus of *Summer Instruction in Science* for 1876. The courses in Phænogamic and Cryptogamic Botany will begin July 7th, and continue six weeks. Applications should be made before June 1st, for the former, to Prof. G. L. Goodale, Cambridge, Mass.; for the latter to Prof. W. G. Farlow, 6, St. James' Ave., Boston, Mass.—5. Hurd & Houghton purpose issuing *Wild Flowers of North America*, illustrations by Isaac Sprague, text by Prof. Geo. L. Goodale. The work will be expensive but will no doubt be done in the best manner.

§ 90. **Asplenium Felix-fæmina**, Bernh. *Var.* **laciniatum**, Moore.—Some time last August Miss Eliza Hosmer, of Concord, Mass., while on a visit to Red Bank, N. J., sent me two very peculiar fern fronds, not fruited, which at the time I could not clearly identify. Recently I have become satisfied that they belong to the above-named variety of English authors, and as it has not before been discovered here, and has the best claim to be considered a variety of any form of that protean species, I think it would be well to make a note of the discovery. GEO. E. DAVENPORT.

Boston, March 24th.

§ 91. **Acanthospermum xanthoides**, DC.—This plant is abundant in the streets of Aiken and Augusta, having appeared within the past ten or twelve years—supposed to be brought from South America in wool for the Augusta factories. H. W. R.

ERRATA.—§ 83, l. 7, for "first" read "foot": p. 82, l. 24, for "1815" read "1851".

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Vol. VI, No. 17.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, May, 1876.

§ 92. **List of Colorado Musci and Hepaticæ**, collected by T. ~~L.~~ S. BRANDEGEE in 1873–75, determined by E. A. RAU with the assistance of C. F. AUSTIN and T. P. JAMES. Among these are four new species, three of which are described in the TORREY BULLETIN, Vol. VI, pages 45 and 46.

MUSCI.

Weissa viridula, Brid.—W. cirrhata, Hedw.—W. crispula, Hedw.—W. crispula, *var.*, plants much smaller than in the usual forms, leaves dark green, with much closer areolation, etc.

Gymnostomum rupestre, Schwaegr.—G. Brandegei, Austin.

Dicranum scoparium, Linn.—D. rhabdocarpum, Sulliv.

Campylopus Rauei, Austin in litt. March 15, 1876.

Fissidens exiguus, Sulliv.

Desmatodon cernuus, Br. Eu.—D. latifolius Br. Eu. *var.*, β glacialis. —D. Lau~~t~~eri, (Schultz) Br. Eu. r

Didymodon rubellus, Br. Eu.

Distichium capillaceum, Br. Eu.

Barbula ruralis, Hedw.—B. mucronifolia, Schwaegr.

Trichostomum tophaceum, Brid.

Ceratodon purpureus, Brid.—C. purpureus, *var.* xanthopus.

Encalypta vulgaris, Hedw.—E. vulgaris, *var.* obtusa.—E. vulgaris, *var.*, with leaves very obtuse, obovate-oblong: costa shorter than in the preceding, peristome pale and fugacious. A fine *var.*, very distinct from the former, both in shape of the leaves and in the presence of a fine peristome.—E. ciliata, Hedw.

Orthotrichum anomalum, Hedw.—O. cupulatum, Hoffm. *var.* minus. —O. Sturmii, H. & H.—O. Kingianum Lesq.—O. Watsoni, James.

Coscinodon Wrightii, Sulliv.—C. Rauei, Austin.

Grimmia obtusa, Schwaegr.—G. calyptra, Hook.—G. anodon, B. & S. ta —G. apocarpa, Hedw.—G. apocarpa, *var.*, leaves broader and shorter, peristome paler, teeth, narrower, etc.—G. plagiopodia, Hedw.—G. Brandegei, Austin.—G. ovata, W. & M.

Tayloria serrata, B. & S.

Funaria hygrometrica, Hedw.—F. hygrometrica, *var.* patula.

Bryum pyriforme, Hedw.—B. cruduum, Schreb.—B. nutans, Schreb. —B. cernuum, Hedw.—B. intermedium, Brid.—B. cirrhatum, H. & H.—B. bimum, Schreb.—B. pallescens, Schwaegr.—B. caespiticum, Linn.—B. argenteum, Linn.—B. obconicum, Hornsch. —B. pseudotriquetrum, Hedw.—B. turbinatum, Hedw.—B. turbinatum, *var.* latifolium.

Mnium cuspidatum, Hedw.—M. affine, Bland.—M. serratum, Schrad.

Timmia megapolitana, Hedw.

Polytrichum juniperinum, Hedw.

Fabronia Wrightii, Sulliv.—F. Wrightii, *var.* of a larger growth, leaves less strongly serrate, etc.

Leskea polycarpa, Hedw.

Pseudoleskea atrovirens, Schwaegr, *var.* brachyclados.

Brachythecium denticulatum, Linn.—B. rivulare, Bruch.—B. collinum, Schp.—B. collinum, *var.*—B. Utahense, James.—B. Fendleri, Sulliv.
Eurynchium strigosum, Hoffm.—E. diversifolium, Br. Eu.
Amblystegium confervoides, Schwaegr.—A. minutissmum, S. & L.—A. serpens, Linn.—A. orthocladon, Beauv.—A. radicale, Brid.—A. compactum, C. Müll.
^ε Sterodon plicatile, Mitt.
Limnobium palustre, Br. Eu.
Hypnum filicinum, Linn.—H. uncinatum, Hedw.—H. reptile, Mx., *var.*—H. curvifolium, Hedw.

HEPATICÆ.

Marchantia polymorpha, Linn.
Jungermannia pumila, With.—J. tricophylla, Linn.
Scapania compacta, Linn.
Reboulia hemisphaerica, Rad.

§ 93. **Acanthospermum xanthoides and Clerodendron Siphonanthus.**—It would be well if the date of the appearance of introduced plants were recorded, and the history of their advents made out before they became widely disseminated, and I was glad to see Prof. Wood make mention of the above-named plants in the March No. of the Bulletin. In regard to these plants he has been misinformed; one would infer from his notes that *Acanthospermum* was first detected last summer, and that the *Clerodendron*, though known for several years past, was now first determined. Having known both plants for several years, it is proper that the record as to these points should be modified I saw *Acanthospermum* growing abundantly in the Southern States over four years ago, and had previous to that time received specimens from Mr. P. J. Berckmans, who lives a few miles from Augusta, Ga. Having named the *Clerodendron* for him several years ago, I wrote to Mr. Berckmans asking him for the history of both plants. Though actively engaged in the nursery business, Mr. B. is interested in, and an accurate observer of native plants, and all others that he meets with, and we are indebted to him for the knowledge of localities for several choice Southern species, especially for a new locality for the rare and unfruitful *Elliottia*, as recorded in the Bulletin a few years ago. In reply to my inquiries, Mr. Berckmans writes:

Acanthospermum xanthoides.—About the year 1851 the then existing factory of Belleville, a few miles from Augusta, received a quantity of wool imported from Buenos Ayres. This wool was found to contain great numbers of small burs, which were separated by the picking machine, and the "trash" was thrown outside of the picker room. The following year there sprang up innumerable plants of a spreading habit, which covered the ground all around the factory, and in a very few years the surrounding country was filled with the plant. The hooks upon the involucre allow the heads, or burs, to attach themselves to the legs of cattle, and in this way the seeds are carried about and widely scattered.

I first saw the plant in 1857, when it made its appearance on my place simultaneously with *Lespedeza striata*, and I attribute its introduction here to the servants, who formerly had frequent intercourse with those at the Belleville factory. I have seen the plant in numerous places along the South Carolina Railroad, and also in Savannah, and there is scarcely a roadside within many miles of Augusta, if the soil is sandy, that is free from this plant. While it seems to prefer sandy localities, it will grow quite luxuriantly on clay soils. Mr. Ravenel gave me its name many years ago.

Clerodendron Siphonanthus.—In 1870 a friend gave me a water color painting, which he made in 1854 or '55, of a plant found growing at Charleston, S. C., in which city he then lived, with a request to give him the name of the plant. Not recognizing it, I sent the drawing to Mr. H. W. Ravenel of Aiken, S. C., who was also unable to give the name, and I afterwards sent the drawing to Dr. George Thurber for the purpose of ascertaining its name. In 1873 I found numerous specimens of the plant in a garden in Augusta, from which I procured some flower stems and sent them to Dr. Thurber, who in a few days replied to my query, by giving it the name—*Clerodendron Siphonanthus.* I at the same time sent specimens to Prof. Asa Gray, who wrote me a few days after Dr. Thurber, giving it the same name. When Mr. Ravenel received the drawing, he informed me that the plant had been growing in his garden for several years, it having been sent to him from lower South Carolina, but that his produced white flowers. The drawing was made from plants found on Sullivan's Island, in Charleston harbor, it being supposed that the seed was introduced with ship's ballast, unloaded at the island. Being in Macon, Ga., in the fall of 1873, I saw several specimens of the plant in the garden of Wm. B. Johnston, Esq., to whom I gave the name, which I had recently received from Drs. Gray and Thurber, and it being difficult to remember, wrote it down for him.

I have both the yellow and white flowered forms in cultivation, the latter from Mr. Ravenel. The plants perfected their fruit in the fall of 1874; it is a fleshy berry of an intense sky-blue color.

P. J. BERCKMANS.

I feel quite sure that I saw *Acanthospermum* described in one of the southern agricultural journals, several years ago, but not having access to a file of these, I am unable to give the reference.

GEORGE THURBER.

§ 94. **Phaseolus multiflorus.**—In "Vegetables cultivated by the Indians, II." (BULL. p. 87) it is said that "Dr. Trumbull thinks the American bean described by Cornuti, pp. 184–5, could not have been P. multiflorus, L., as the seeds were 'subrotundi et nigri.'" The present writer having given expression, at the same place cited just above in your article, to a different view, it is proper to say that Willdenow who, and not Linnæus, was the author of P. multiflorus, founds the latter directly on Cornuti's plant. (Willd. Sp. Pl. 3, p. 1030.) As to Purslane we cannot, except by inference, carry it further back than "the first settlement of the country," which is the date assigned in the note on Josselyn.

It has been indicated (Int. to Josselyn, p. 16, and p. 17, note) that this writer was a botanist in some sort, and deserves, therefore, more credit with botanists than people who made no pretence to botanical knowledge, and probably had none. Josselyn's "Purcelane" really is worth something, and so, as a pretty clear illustration, may be Champlain's "Pourpié;" but what the "Purselin" of the Virginian woods may have been (Strachey's Travaile, as cited) is utterly in the dark. EDWARD TUCKERMAN.

Amherst, *May* 5*th*.

§ 95. **Rhododendron maximum,** *L.*—"The Practical Farmer," February 19th, says that this plant "has been discovered by R. Morrison in the wilds in the rear of Sheet Harbour, Nova Scotia." Latitude 45° N.

§ 96. **Our Wild Gooseberries.**—Under this caption Dr. Gray has an article in the American Naturalist for May, in which he says that "the wild gooseberries of the United States are not in a satisfactory condition as they stand in the books, and that information and specimens are needed. A response to this appeal made by a few persons happily situated, in this and that part of the country, may perhaps clear up the principal difficulties in the course of the current season." Our species are: 1. Ribes lacustre, Poir.—2. R. leptanthum, Gray, of the Rocky Mts. Are the flowers yellow or yellowish?—3. R. setosum, Lindl. (R. oxycanthoides, Hook. non Linn.) white-flowered, short staminate. Saskatchawan region, perhaps on the N. W. shore of Lake Superior.—4. R. Cynosbati, L.—5. R. gracile, Mchx. (R. Missouriense, Nutt., R. niveum, Lind., R. triflorum; Hook.?) Western, filaments long, almost capillary.—6. R. rotundifolium, Mchx. Dr. Gray wishes "flowering specimens from all parts of its range, for the limits between it and the following are obscure.—7. R. oxycanthoides, L., (R. hirtellum, Mchx., R. saxosum, Hook., R. setosum, Mchx.) stamens only slightly exceed the calyx lobes if at all.—8. R. divaricatum, Douglas, of the Pacific side. There is a form, *var.* irriguum, R. irriguum, Doug., of which we know too little, which comes near to R. rotundifolium.—9. R. Lobbii, Gray, (R. subvestitum, Hook & Arn.) this little known species of the Pacific coast is distinguished by its purplish red, larger calyx, and from the following by its short and blunt anthers.—10. R. Menziesii, Pursh. (R. Californicum, R. occidentalis and R. subvestitum, Hook & Ar.) Oregon to Cal., anthers sagittate.—11. R. speciosum, Pursh, the scarlet-flowered gooseberry of California, with long stamens and fuchsia-like blossoms, is quite distinct.

R. rotundifolium from Fort Lee and foot of 60th St. of the BULLETIN Catalogue are errors which should be corrected, they were simply escapes of R. Grossularia.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may* ***be found at 245 Broadway.***

Vol. VI, No. 18.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, June, 1876.

§ 97. Some more rare Southern Plants.

Indigofera Anil, Linn.—Introduced over a century ago for Indigo culture, and still surviving on old settled places along the seabound.

Conyza ambigua, DC.—This plant, common enough in the streets of Charleston and on old places thirty or forty miles around, is C. sinuata, Ell Introduced.

Rudbeckia? Porteri, Gray.—I found this species in 1848 at Stone Mt., Ga., growing abundantly on the ridges and top of the mountain with Quercus Georgiana. Prof. T. C. Porter had just preceded me in its discovery and the uncertain genus was dedicated to him. I have never heard of it any where else.

This outlying granitic peak in middle Georgia seems to have an interesting Flora. Besides Quercus Georgiana and Rudbeckia? Porteri, I found a well-marked variety of Hypericum prolificum, and Mr. Canby has since (in 1869) found a new species of *Isoetes* growing in shallow pools on the summit.

Carya olivæformis, Nutt.—This species, a native of the S. Western Gulf States, is thoroughly naturalized on the seaboard region of this State. I have seen ten old trees which were said to be the original planting over a century ago, with a diameter of some three or four feet. They have been propagated spontaneously as well as by hand of man, grow vigorously and bear fruit abundantly. It is a curious fact, however, that seedlings oftener produce a nut more closely resembling C. aquatica (common in the swamps around) than the original Pecan. Is this the result of true hybridity?—or, only of a strong tendency to variation, developed in a region of country where C. aquatica is the native type?

Juniperus communis, Linn.—This tree is not accredited south of New Jersey in any of our botanical books. A few years ago I found two patches of the prostrate form growing on poor sandy hills about two miles south-west of Aiken. This spot is in virgin forest of Pine, Oak, &c, and there are no signs of clearing or of former cultivation, by which their introduction may be traced to hand of man. The plants are *strictly prostrate*, some of the limbs eight to ten feet long, trailing on the surface without any assurgency towards the extremities. Strange that the Alpine form of a tree which grows one thousand miles north, should be found here, flourishing on these warm sand hills!

Mercurialis annua, Willd.—I found this plant many years ago, growing very luxuriantly near the wharves in Charleston. Introduced.

Stillingia sebifera, Mx.—This exotic from the East, is now thoroughly naturalized around Charleston, and for some forty or fifty miles distant. Many years ago, visiting the former residence of Thomas Walter, the author of Flora Caroliniana, on the Santee River, I saw there two clusters of this tree, bearing marks of old age. They had successfully resisted the encroachments of the surrounding vegetation, and, together with one or two other plants, were the sole survivors of his botanical garden. Walter died in 1788.

Epidendrum conopseum, Ait.—This, the only tree Orchid in our State, ranges from Florida upwards along the coast. Elliott records, as its most northern locality, Edding's Bay, at entrance of Port Royal Inlet. I found it many years ago, but only in small quantity, not more than ten or a dozen specimens altogether, about thirty miles north of Charleston, near the village of Pinepolis, not far from Monck's corner on N. E. R. R. It was growing on Nyssa aquatica, in damp Pine woods. This is probably the most Northern limit yet discovered. H. W. RAVENEL.

AIKEN, S. C.

§ 98. **Distribution of Preissia commutata**, Nees.—My attention has been called to a note from Edward S. Burgess, Panama, N. Y., in the September number of the BULLETIN (Vol. 6, No. 9), which contains the statement that this plant is "said in Sullivant's Manual to grow at Lake Superior and Niagara Falls, the only two habitats hitherto known in this country," and adds the newly discovered habitat at Panama, N. Y.

I was not aware that this plant is supposed to be so restricted in its distribution. I have collected it on the lower as well as the upper peninsula of Michigan, and in Wisconsin, on Lakes Huron and Michigan, as well as on Lake Superior, at which last mentioned place it is most abundant. On referring to my notes I find the following records of localities of the plant: On Lake Superior, on sandstone rocks at Laughing-Fish River, Michigan, June 14, 1867; and at Eagle River, Mich., Sept. 10, 1871; beside a number of places of which I have no record. On Lake Michigan; on rocks, White-Fish Bay, Wisconsin, June, 1866. On Lake Huron; Port Austin, Michigan, June 18, 1872, on Sandrock, and Pointe Détour, Michigan, on rocks, Sept. 19, 1875. It is worthy of mention that Pointe Détour is thickly strewn with drift boulders, some of a large size, brought from Lake Superior and northward, and here deposited by glacial action; and it was on these boulders only that the *Preissia* (probably thus transported from the northward) was found by me. The rock in place belongs to the Niagara Limestone, and abounds in the most interesting corals, shells, etc., of that group. The plant seemingly prefers sandstone rock. At Port Austin, far to the southward of Pointe Détour, the sandstone on which this hepatica grows is in place, but it is of a later formation.

Aplectrum with Coral-like root.—I have lately discovered (April 9, 1876.) in the woods north-east of Detroit, Mich., two adjoining plants of *Aplectrum hyemale*, Nutt., having branched and toothed coral-like roots, similar to those of the genus *Corallorrhiza*, immediately below the usual bulb or corm, which also had the ordinary rootlets. Each plant had the green leaf which the species sends up in Autumn. The coral-like roots appeared to be parasitic on the partly decayed bark of a tree-root. A large number of plants of the species (much more than one hundred) taken from the same locality at different times, presented no such peculiarity. This is an interesting and significant discovery, and, as Prof. Gray (to whom I sent my specimens) adds, "indeed unexpected." I beg to call the attention of botanists to it, that we may learn whether the peculiarity exists elsewhere, and, if so, to what extent.

HENRY GILLMAN.

DETROIT, Michigan.

§ 99. **New Species of American Fungi**, by F. VON THÜMEN.

Corticium fumigatum, Thm. *nov. spec.*—C. amphigenum, late effusum, adglutinatum, membranaceum, tenue, e fusco-fumosum, ambitu concolore, similari; hymenio nudo, rimoso, expallescente, sicco, fumoso, subpruinoso, subpapilloso, papillis sparsis, rotundatis, minimis.

Newfield, N. J. in ramulis aridis Caryae, Vere 1875. Leg. T. B. Ellis. (no. 2247.)

Corticium rubrocanum, Thm. *nov. spec.*—C amphigenum, late effusum, membranaceum, tenue, e pallide isabellino, canum, ambitu concolore, vix pallidiore, glabro; hymenio sicco, glabro, subrimoso, rigido, cano, non papilloso.

Newfield, N. J. ad Quercus coccineae ramos emortuos, Vere 1875. Leg. T. B. Ellis. (no. 2248.)

Diatrype disciformis, Fr., *var.* **Magnoliae**, Thm.—Differt disco vix convexulo, minore, atro, ostiolis indeterminatis a forma europaea. Asci, sporiadiaque non diversa sunt.

Newfield, N. J. in ramulis emortuis Magnoliae glaucae. Vere 1875. Leg. T. B. Ellis.—Thümen, Mycotheca universalis, no. 359.

Ustilago Fimbristylis, Thm. *nov. spec.*—U. sporis simplicibus, plus minusve globosis, vel pauci irregulariter rotundis, vel sphaericis, haud raro ellipsoideis, pauci pellucidis, episporio laevi, non punctato, tenui, 12–14 mm. in diam., fuscis.

Virginia (sine loco) in seminibus maturis Fimbristylis autumnalis, R. & S. Leg ?—Com. Baron Ferd. von Mueller, Melbourne, Victoria.

§ 100. **Phaseolus multiflorus.**—In a note on Josselyn, p. 108, Professor Tuckerman identifies Cornuti's American bean with "*Phaseolus multiflorus*, L." When citing this note, in a letter quoted in the BULLETIN (p. 87), I overlooked the error of attributing the species to Linnæus. Professor Tuckerman points it out, in the BULLETIN for May (p. 91), observing that "Willdenow who, and not Linnæus, was the author of P. multiflorus, founds the latter directly on Cornuti's plant." Is there any reason for giving Willdenow a species named and described ten years earlier by Lamarck? In the Encycl. Methodique (Botanique, iii. 70), published in 1789, Lamarck claimed as his own "P. multiflorus, Haricot multiflore, ou d'Espagne." Willdenow, in 1800, adopted Lamarck's specific name, copied his authorities, and referred to him for more ample description of the plant (Sp. Pl., iii. 1030). Sprengel names Lamarck as the author (Linn. Syst. Veg. iii. 254). As to the question of identity, I must still doubt. Cornuti's "faseoli fabæ Græcæ modo, *subrotundi and nigri, nec nitida cute obducti sed obscura*," do not seem to belong to our P. multiflorus.

J. H. TRUMBULL.

HARTFORD, *June* 19.

§ 101. **Letter from Prof. I. H. Hall.**—The Syrian Protestant College is on high, rocky ground, about a mile from the centre of Beirut, just opposite the point of rocks that juts farthest north into the sea on Râs Beirut. Beirut lies on a jog in the coast, so that the city generally, and the front of the college in particular, look out on the sea towards the north. I hear the noise of the sea continually, as I sit in my room. To the west, the coast bends southward just by the observatory, and we have a splendid sweep of sea view in that direction also. The college grounds are full of flowers—a real wild botanic garden, with a very great number of species, of which I cannot give even a catalogue just now; and all winter we have a succession of flowers. The most showy things out at present are the Ranunculus Asiaticus, a splendid crimson-scarlet flower, from 2 to 3½ inches in diameter, the flaming poppy, and a beautiful wild pink gladiolus with wide grass-like leaves, that grows in the standing corn. The most delicate and beautiful Cyclamen Aleppicum—of which more another time—is just going out of flower. I can only mention the ferns this time. We have four ferns on the college grounds: the Adiantum Capillus-Veneris, the Asplenium Ceterach, the Cheilanthes fragrans (or odora), and a Polypodium which I have not found in sufficient quantities to make out. They all grow in crevices in the rocks. The first mentioned has an Arabic name which signifies "dweller in the pits"—*i. e.*, in the *beers*. This will not surprise one who has seen this fern growing in the Roman baths, or in the deep places at Pompeii. Indeed, the best locality for it on the college grounds was inside of the recesses of a nest of old Phoenician tombs which were brought to light in excavating for the foundations of the main college building, of which tombs the fern immediately took possession. However, the locality was destroyed a few weeks ago, as the tombs had to be blown up and filled in for sanitary reasons. In this last mentioned process, however, another *beer* was brought to light; for, like all the hill-sides of the region, Râs Beirut is riddled with old tombs, the entrances and steps to many of which are visible without any excavation. The Asplenium Ceterach grows deep in the crevices of the rocks, much after the manner of A. pinnatifidum. It also grows in the stone walls all about Beirut. The Cheilanthes is scarce; but on the Greek island of Sira, behind the town, I found it in abundance, along with Nothochlaena lanuginosa. In the town, ferns from the mountains are cultivated with more or less success, but the ferns of the region are not numerous.

BEIRUT, Syria, *April* 6, 1876.

ERRATA.—§ 92, l. 1, read "T. S. Brandegee"; l. 7, read "Weissia"; l. 15, read "D. Laureri"; l. 30, read "G. calyptrata"; page 90, l. 5, read "A. minutissimum"; l. 8, read "Stereodon".

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BULLETIN OF THE TORREY BOTANICAL CLUB.
Vol. VI., Nos. 19 & 20.] [New York, July & August, 1876.

§ 102. **Ferns.**—We have received Mr. Davenport's Catalogue of the Davenport Herbarium, Mass. Hort. Soc., corrected to Ap. 3d, 1876; and Mr. Wm. Edwards' Catalogue of North American Ferns, May, 1876, corrected by Prof. Eaton. Mr. Edwards' address is South Natick, Mass. He will mail his useful catalogue for 25 cents a dozen. This list comprises 132 species and 20 varieties, of which 49 species and 2 varieties are peculiar to North America, *i. e.*, America north of Mexico. Mr. Davenport's list has 124 species and 26 varieties. Mr. Davenport, it will be seen admits more varieties than Prof. Eaton does in Mr. Edwards' catalogue; in the latter, for example, *Asplenium Filix-femina* has only the variety *Michauxii*, while Mr. Davenport gives also *angustum*, *cristata* [*um ?*] and *laciniatum*. The former does not seem to recognize *Botrychium simplex*, var. *bipinnatifidum*. In connection with fern variations, perhaps the interest felt in this subject may justify us in mentioning that Mr. A. H. McKay, of Pictou, N. S., has found a variety named provisionally by Prof. Lawson, *Cystopteris fragilis*, var. *McKayii*. Mr. McKay finds *Aspidium Filix-mas*, Swartz, in that quarter.

Mr. Hall writes: If any of the Club ever take a trip in search of *Cheilanthes tomentosa*, the following extract from a letter from Rev. D. R. Shoop may do some good. I do not think it will do harm to publish the locality: "Where I gathered Cheilanthes tomentosa was at Painted Rock on the French Broad River—just above the North Carolina and Tennessee line. Hot Springs, close by, is a good place to stop, a summer resort; and I think one could not miss the Cheilanthes on the rocks up the river—just where, I cannot say. Doubtless it could be found nearer, in Virginia or Kentucky."

Mr. L. A. Millington writes from Glens Falls: Two different plants of fragrant *Aspidium Noveboracense*, Swartz, were found in this vicinity last summer. I have roots in my garden brought from the north, which have deliciously fragrant fronds thus far.

§ 103. **Publications.**—1. *Botany of California.* The first volume is now ready, price six dollars, which is extremely low. Copies may be obtained on application to Sereno Watson, Botanic Garden, Cambridge, Mass. As the weight is nearly five pounds, it cannot be transmitted by mail. The present volume comprises the Polypetalæ by W. H. Brewer and Sereno Watson, and the Gamopetalæ by Asa Gray. As the Legislature of California has since 1874 made no appropriations to continue the Geological Survey of the State, this volume would have remained unpublished had not a few citizens of San Francisco contributed a sum sufficient to insure its publication. The proceeds of the sale of this will go to aid the publication of the second volume, which is intended to contain the remaining exogenous (*Apetalæ*, *Gymnospermæ*), the endogenous, and the cryptogamous orders, with index, etc. All botanists will feel grateful for what has been accomplished of this very important work, and will look longingly for its completion. The difficulty and interest of the task may be understood from the fact that not only has there been here for the first time attempted a Flora of California, comprising 150,000 or 160,000 square miles, but that for this purpose it has been found necessary to work up the whole eastern slope of the Sierra Nevada, and of the ranges adjacent to it on the east, from Arizona to Northern Nevada, and of Southern Oregon. —2. *Flora of South-western Colorado*, by T. S. Brandegee, Depart. Interior, U. S. Geol. and Geog. Survey of the Territories. After a general description of the flora and its distribution, Mr. Brandegee gives a list of the plants not included in Porter and Coulter's Catalogue. There are quite a number of new species (several *Astragali* of course) described by Dr. Gray, and Dr. Englemann. The list of Musci and Hepaticæ by Mr. Rau has appeared in the BULLETIN, May, 1876, with the exception of a new species here described by Mr. Austin, *Dicranum* (*Campylopus*) *Rauei*. We notice that *Weisia* here as in our list is spelled *Weissia*. We believe, as Mr. Rau has pointed out to us, that one *s* is the proper form.—3. *Notes on Agave*, by Dr. Geo. Engelmann, from Trans. Acad. Sci., St. Louis, Vol. III., Dec. 1875, with fine photographs of A. Shawii, a new species, and "one of the most striking and beautiful." Sixteen species are described, all but three found in the United States, and six or seven new to science. There are others in Mexico and, perhaps, a few in the West Indies and South America. Those who have the opportunity to observe the various stages of the flowers of species of Agave, should communicate with Dr. Engelmann, as there are several points that need elucidation, the hour when the anthers shed their pollen, the expansion of the stigmas, secretion of honey, etc. Agave Virginica seems to be the only one that he has had the opportunity of observing on these points.—4. *The American Journal* for July, among its botanical notes, has an interesting account by Dr. Gray of *Heteromorphism in Epigæa.* Fruit is seldom met with. There are four kinds of flower; *the first*, with long style and perfect stigma, *the second*, with perfect stigma likewise, but shorter style. From the first came the fruiting specimens received. Both have more or less abortive anthers lower than the stigmas. These two forms amounted together to less than 20 per cent. of a large number of specimens from one locality in Maine. In the *third* form, with longer style like No. 1, but imperfect stigma, the anthers abound with pollen and are dehiscent at or a little before the opening of the corolla. The *fourth* has a shorter style with the imperfect stigma as low as the base of the five longer anthers. Otherwise as in No. 3. "The flowers of Epigæa may therefore be classified into two kinds, each with two modifications; the two main kinds characterized by the nature and perfection of the stigma, along with more or less abortion of the stamens; their modifications, by the length of the style. The first is leading to dioicism, the second points to dimorphism,"—a singular fact among Ericaceæ, which usually secure intercrossing by dichogamy, *i. e.*, by developing the anthers before or after the stigma; of this Dr. Gray finds no indication in Epigæa. It is uncertain whether the small stigma forms "are ever fruitful or fully so." As the style and stigma seem to persist this might be ascertained. Fruiting specimens should be sent to Dr. Gray.—5. *Botanical Bulletin*, John M. Coulter, Hanover, Ind. The numbers of this enterprising little publication come promptly at the beginning of each month. The editor announces for the second volume, beginning in November, a change of name to avoid confusion with that of our BULLETIN. The *Botanical Gazette* will contain eight pages monthly at one dollar a year, and has the promise of assistance from well known botanists.—6. *Field and Forest*, Vol. II, No. 1, C. R. Dodge, Editor, P. O. Box, 273, Washington, D. C. The July No. begins a new volume, with an increased number of pages, 18. The Flora Columbiana in the August No. is brought down to Scrophulariaceæ. Robert Ridgway gives proof that the Catalpa is a native of the Wabash Valley, Ill. —7. *American Naturalist*, July. Dr. Gray gives the diagnosis of the species of Schœnolirion. The re-discovery by Dr. Wm. T. Feay of Savannah, of Michaux's *Phalangium croceum* has led Dr. Gray to distinguish Torrey's *S. Michauxii* into three species; *S. croceum*, Gray; *S. Elliottii*, Feay; *S. Texanum*, Gray. In the August No., Dr. Gray has an article on Acnida, including Montelia. Botanists along and near the seaboard are particularly requested to examine the species they meet with, and to send good fruiting specimens to him. The distinctions between *A. cannabina*, L., and *A. rhyssocarpa* (*rusocarpa*) Mchx., should be especially looked after. The fruit of the former is hardly to be found in any of our larger herbaria. Its stigmas are very long and filiform almost plumosely hairy, while those of A. rhyssocarpa are comparatively short with utricle rugose. Florida and Western fruiting specimens of any Acnida are much desired. Another station for *Calluna vulgaris* has been found, five miles north of the Tewksbury one—9. *Transactions of the Mass. Hort. Soc.*, 1876, Part I., full of interesting discussions on the cultivation of plants, and the value of special herbaria.—10. *Psyche*, March—June. Contains as usual its excellent bibliographical record, and commences a series of Synoptical tables for determining N. A. insects, beginning with Orthoptera.—11. *The Naturalist's Advertiser*, July, Salem, Mass., gives notice of a proposed new Directory of Naturalists.—12. *Connecticut Valley Botanical Society*. The Springfield Republican of June 14th gives an account of the meeting at Hanover, N. H., in June. Judging from the subjects appointed for the next meeting, there appears to be a great deal of vitality in this association.—13. *Mycotheca Universalis*, by F. de Thümen, Bayreuth, Bavaria. The third century of this work is now issued and contains, among other things of interest, a fine specimen of *Cyttaria* from Tasmania, and several species from the Cape of Good Hope, among which a new Æcidium, *A. ornamentale*, Klchbr., is very fine, the volume also contains representatives of American and British fungi, and in interest is fully equal to its predecessors, *J. B. E.*—14. The Club is indebted to Dr. G. E. Post, of the Protestant College, Beirut, Syria, for a copy of his Botanical Manual in Arabic prepared for the use of the students of that College. Dr. Post was formerly one of the fraternity in this city, and was the first to detect Frangula in the Hackensack marshes.

§ 104. **New Localities.** We found this spring another spot where *Viola rotundifolia*, Mchx., grows in this neighborhood, in the wood back of Tenafly, not far from the river front of the Palisades. This is a southern outpost of Mr. Austin's Closter locality, (BULLETIN, I. 38.) It was found years ago on the banks of the Harlem River, Morrisania, and later on the banks of the Whippany, N. J. These seem its southern limits on the coast. *Ranunculus Cymbalaria*, Pursh, grows in the overflowed flats back of the third landing on Rockaway Beach. *Melilotus officinalis*, Willd., begins to show itself on the railroad near Carmansville. Mr. Wilber reports *Sisymbrium Alliaria*, Koch, abundant near Irvington. *Malva parviflora*, L., was found in October, 1874, by Mr. David F. Day at Wellsboro, Pa., thoroughly established in roadsides, gardens and waste places. Rev. Hermann Wibbe found a year ago near Nassau Village, Rensselaer Co., N. Y., *Azalea viscosa*, L., but this has been found further north and west, vid. Payne's Cat. Near the same village Mr. Wibbe found *Gypsophila muralis*, L., quite naturalized in middle of the road, and in dry barren places in the adjacent fields; also in the streets of Oswego. This is cultivated for borders, from which it has escaped. Mrs. L. A. Millington found a year ago on the western shore of Lake Champlain *Betonica grandiflora*, Spreng. There were two or three scattered tufts growing in the sandy hollows along the rocks of a lonely bay, evidently floated there at high water. They had only a few flowers at the top of the stalk instead of the abundance in garden plants. They were in company with Germander (Teucrium), Potentilla Anserina, L., and Ranunculus multifidus, Pursh, seemed thoroughly at home and likely to thrive. Mrs. M. adds that *Tragopogon pratense*, L., is thoroughly naturalized about Glens Falls. Mr. W. W. Bailey, of Providence, R. I., says that *Ægopodium podagraria*, L., which according to Darlington is a nuisance in some parts of Pennsylvania, has grown for a long time on the back campus of Brown University, where he first found it in 1863. It seems to be completely naturalized, and to be slowly spreading, vid. BULLETIN II., 28; III., 36.

§ 105. **The Oaks of the United States.**—This is a title of a paper read before the Academy of Science of St. Louis, March 20, by Dr. Geo. Englemann. It is not a description of the species, but a classification of them, with a general account of the characters useful for this purpose, and of the synonyms. The White-oaks are distinguished from the Black by the color of the bark, and the tougher, heavier, and more compact wood. The wood of the Black-oaks is brittle and porous, makes poorer firewood, and, made into barrels, holds only dry substances. In them the scales of the acorn-cup are never thickened at the base. The annual rings show that the Oak grows as rapidly in age as in youth, or even more rapidly. The winter-buds, the vernation and venation of the leaves, and the presence (chiefly on the young leaves) of articulated hairs of several cells apparently glandular (clammy) afford specific characters. There is added an account of our hybrid oaks, which are all (6) among the different species of Black-oaks. We give below the arrangement and syonomy, having, for convenience, somewhat changed its form.

QUERCUS, L.

I. **Scaly cupped.** Male aments pendulous; pollen-grains .03—.04 mm. broad; pistillate distant from staminate flowers; stigmas dilated.

A. WHITE-OAKS: Abortive ovules inferior or rarely lateral; stamens generally 6–8; stigmas sessile or subsessile; inside of the shell smooth or very rarely pubescent.

* Fruit annual; inside of nut smooth; abortive ovules inferior.

† Leaves deciduous.

1. ‡ *Q. lyrata*, 2. *macrocarpa*, 3. *alba*, 4. *lobata*, 5. *stellata*, 6. *Garryana*, 7. *bicolor*, 8. *Michauxii*, 9. *Prinus*, 10. *Prinoides*, 11. *Douglasii*, 12. *undulata*.

† † Leaves evergreen.

13. *Q. dumosa*, 14. *Emoryi*, 15. *reticulata*, 16. *virens*.

* * Fruit biennial; inside of nut pubescent; abortive ovules inferior or lateral; leaves evergreen.

17. *Q. chrysolepis*.

B. BLACK-OAKS: Abortive ovules superior; stamens generally 4–6; styles elongated, at length recurved; inside of nut silky-tomentose.

* Fruit annual; leaves persistent or subpersistent.

18. *Q. agrifolia*, 19. *hypoleuca*, 20. *pumila*.

* * Fruit biennial.

† Leaves deciduous.

21. *Q. palustris*, 22. *rubra*, 23. *Sonomensis*, 24. *coccinea*, 25. *ilicifolia*, 26. *Georgiana*, 27. *Catesbæi*, 28. *falcata*, 29. *nigra*, 30. *cinerea*, 31. *aquatica*, 32. *laurifolia*, 33. *heterophylla*, 34. *imbricaria*. 35. *Phellos*.

† † Leaves evergreen.

36. *Q. Wislizeni*, 37. *myrtifolia*.

II. **Spiny cupped.** Male aments erect, bearing pistillate flowers at the base; pollen-grains about .017 mm. broad; stigmas linear.

38. *Q. densiflora*.

The age of the fruit can be ascertained by examining the branchlet, whether it be of this year or the last. The abortive ovules may be found inside the shell and out-side of the seed coat, in the White oaks at the base of the perfect seed, in the Black-oaks just below its tip.

SYNONYMS.

2. Q. obtusiloba, *β*. depressa, Nutt.; Q. Olivæformis, Mchx.—3. Q. Prinus, var., Chap. and DC.—4. vars. palustris, monticola acuminata, Mchx.—12. Q. Gambelii, Nutt.; and probably Q. Drummondii, Liebm.; Q. alba, var. Gunnisoni, Torr.; Q. oblongifolia, Torr.; Q. pungens, Liebm.?—13. Q. acutidens, Torr.; Q. berberidifolia, Liebm.?—14. Q. hastata, Liebm. Often confounded with 12 var. Wrightii.—16. Q. maritima, Willd.—17. Q. crassipocula, Torr.; Q. fulvescens and Q. vaciniifolia, Kellogg.—18. Q. oxyadenia, Torr.—19. Q. confertifolia, Torr.—20. Q. Phellos, var. pumila, Mchx.; Q. cinerea, var. pumila, Chap., DC.; Q. sericea, Willd., Pursh; Q. Phellos, var. sericea, Ait.—22. Q. runcinata, Englm.—24. Q. tinctoria, Bart.?—Q. quinqueloba, Englm.—37. Q. Phellos, var. arenaria, Chap.; Q. aquatica, var. myrtifolia, A.DC.

§ 106. **Plants found in the Missouri Valley, Iowa, in 1875. Dalea laxiflora,** Pursh; abundant on the steep sand "Bluffs" at Missouri Valley Junction and at Crescent City, near C. & N. R. R., **Aplopappus spinulosus,** DC., (small form, Gray) abounds with the Dalea in the first mentioned locality; **Astragalus Plattensis,** Nutt., is common at both. **Euphorbia hexagona,** Nutt., with **E. serpens,** H. B. K., and **Oxybaphus alb[id]us,** [Sweet] and **O. angustifolius,** Sweet, the first two common, the last two scarce on the Sioux City R. R. Missouri River Bottoms alone. **Grindelia squarrosa,** Dunal, near Council Bluffs, and Logan, Harrison Co. **Yucca angustifolia,** Pursh, abounds on the steep Sand Bluffs—so uniquely carved—near Little Sioux, and near Honey Creek (20 miles apart.) **Oxytropis Lamberti,** Pursh, abundant in similar situations, early. **Desmanthus brachylobus,** Benth., common in the rich Mo. R. Bottoms. **Lonicera parviflora,** Lam., not very common, in ravines along the "Bluffs" above. **Nasturtium sinuatum,** Nutt., rare. on the bank of the Chicago & N. W. R. R. **Sisymbrium canescens,** Nutt., becoming abundant along with above. **Iva xanthifolia,** Nutt., displacing **Helianthus giganteus,** L., along C. & N. W. R. R., with **Arabis hirsuta,** Scop., and **A. laevigata,** DC., for forty miles N. E. of Council Bluffs. **Lathyrus palustris, L.,** var. **myrtifolius,** in rich ravines among hazel-brush. **Gaura coccinea,** Nutt., common only on steepest sand hills, Council bluffs, Crescent City, and Missouri Valley Junction. **Veronica peregrina,** L., scarce on R. R. track. With these are found; **Paspalum læve,** Mchx., **Sporobolus cryptandrus,** Gray, **Cinna arundinacea,** L., and **Melica mutica,** Walt.

The above I consider a truly gorgeous list, and the man who has seen them in full bloom in their native habitat, is to be envied! Those rich, cream-white Yuccas, with long panicles, in *one* group on the almost perpendicular hill-side; in another group, on the next "Bluff," the rich purple Oxytropis; on another the rare, expansive, silky panicles of the Dalea, the yellow Aplopappus and Grindelia; the white and red Gaura in the same romantic situation, with the common Phlox pilosa in still larger and more dazzling groups. All this splendor is set off by the rarely carved "Bluffs" on which they grow, ever changing in form,—in one place the bright **Euphurbia marginata,** Pursh, struggling up the side, over the summit at last! R. Burgess.

§ 107. **Letter from Mr. Hall.**— * * * It may be interesting to the club to know that the ordinary edible artichoke (not the Jerusalem artichoke, of course) is here cultivated, as in France and Italy, and is still known by its old Arabic name of *ardi shauki*, or earth-thorn. I believe the lexicons give this as the original of the present names in English, French and Italian. The Portugese name is directly derived from another Arabic word.

The Yucca militaris, or "Spanish bayonet," thrives well in Beirut. On the college grounds are several flourishing specimens. Two plants in the church-yard of the Anglo-American church blossom and fruit in abundance. Several species of the Cactus family thrive well out of doors, as do also many species of our hot-house geraniums. But some useful American or European plants cannot be made to grow successfully; among them, I am sorry to say, the strawberry. The little wild clover here is a dwarf species but very fragrant. The apples and pears are wretched. The potatoes are good, and are said to have descended from some which a missionary planted in the mountains some thirty years ago—in times of persecution, too, which drove him out of the country, but left thus one fruit of his labors. Green peas, of several varieties, are good and abundant, but the native lentiles are much more so. The " Oddis," a lenticular shaped fruit of this kind, about one third the size of a moderately large pea, is one of the most common. This assumes a reddish color when boiled, and is commonly supposed to be the red pottage for which Esau sold his birthright. It is not very much to my taste, but is very much liked by the natives, even those born of American parents. The immense prickly pear, used everywhere for fences, impenetrable by anything from chickens to cavalry, produces fruit abundantly, which is esteemed excellent and cooling in summer. The plant is the same with that seen so abundantly in Southern Italy, Cyprus, etc., and I have occasionally eaten its fruit in New York. I am here reminded that the general aspect of the vegetation here (as indeed might be expected) strongly resembles that of Southern Italy. Prominent, of course, are the Fig, Olive, Kharûb ("husks that the swine did eat") and the prickly pear—called Indian Fig in Italy—with many similar cultivated herbaceous things. The most striking difference is the occurrence here of the date palm, which I first met on the island of Syra, about the public square of the town. The edible nuts of one species of pine, too, are an extensive article of food here, as well as about Naples. Here it is called *Snober*, and is much used in all sorts of dishes.

The Ornithogalum umbellatum is now in flower everywhere; but, whether owing to the scarcity of rain or not, it appears to me to be in a rather starved condition. A Scilla, which I am told by the botanists here is the Scilla Fraseri, though it appears to me quite different from my recollection of it as I saw it in America, is strikingly abundant. I found it everywhere in Syra, about Smyrna, and Ephesus, and almost covering the ground in wide spaces over the site of ancient Citium and about the Larnaca salines in Cyprus. The Cypriotes told me that the bulb was poisonous, producing headache, delirum and death. As you are doubtless aware, the Eastern end of the Mediterranean is the country of bulbs, both for species and quantity.

Heliotropium Europæum; the scentless heliotrope, is very common here; and indeed everywhere that I have been after reaching Southern Italy. But about Smyrna and Ephesus I found the scented heliotrope quite frequently.

BEIRUT, *April 8th*, 1876.

§ 108. **Phaseolus multiflorus.**—The point made by the writer, in replying, in your last number but one, to a criticism of Dr. Trumbull's, was that Phaseolus multiflorus was founded on Cornuti's plant; which last then, the inference is obvious, should be what was originally meant by P. multiflorus.

The other question, especially considered in your number 18, as to the author's name to be cited after P. multiflorus, was only touched on by the way by me, and is scarcely as interesting. De Candolle gives (Prodr. 2, p. 392) the credit to Wildenow; and was the authority upon which I relied. But it is plain, on a second look at the German author, that he did not claim the species; and Steudel also gives it to Lamarck. EDW. TUCKERMAN.

AMHERST, *July* 5.

Talking of *beans* and whether we know them, it may be well to note in the BULLETIN that the oldest name for Cornuti's plant is *Phaseolus coccineus*, Linn. Spec. 724. In the second edition (p. 1016) Linnæus refers it to P. *vulgaris* as var. *coccineus*, and this reference only is cited by Lamarck, Wildenow, and De Candolle, probably overlooking the earlier one. It is even omitted by Steudel in his nomenclature. S. W.

§ 109. **Hyde Park.**—During the last week in July I noticed on the banks of the river opposite Hyde Park, N. Y., several trees of *Rhus glabra*, L., on which, instead of berries, were thyrsi of abnormal green leaves, about 3″ broad, and 1′ long, strongly involute, and looking like plumes in the distance. At the base of one thyrsus were several scarlet drupes, as in the regular fruit clusters. Is this common?

Near Hyde Park station there are still some fine plants of *Galium Mollugo*, L., noticed in the BULLETIN for Sept., 1873. On the lowlands near Hyde Park *Rudbeckia triloba*, L., is not uncommon. I send leaves of a specimen picked July 28.

On a bank a mile south of the village *Pentstemon pubescens*, Soland., was found during the past month, and on a dry sloping rock still farther south, in company with *Opuntia Rafinesquii*, Englm., were several blossoming plants of *Asclepias verticillata*, L. In the neighborhood stands a flourishing colony of *Solea concolor*, Ging. E. E. BUTLER.

DOVER, N. J., *Aug.* 1.

§ 110. Additions and Corrections to Botanical Directory, Supplement, 1876.

Atkinson, John C., Henderson, Ky.
Austin, E. P., Cambridge, Mass.; *not active.*
Barnes, C. R., Madison, Ind.
Bebb, M. S., Fountaindale, Ill.; *omit Spec. and Ex.*
Biddlecome, Miss H. J., Springfield, Ohio. *Ex. Filices and Musci.*
Burgess, E. S., Panama, N. Y. *Removed.*
Burgess, Rev. Robert Ames, Iowa. *Ex.*
Calkins, W. W., 236 S. Water St., Chicago, Ill.; *Ex.*
Chalmers, Robert, Campbellton, New Brunswick, Br. Am.
Charlton, T. J., Vincennes, Ind.
Comstock, Fred. H., 262 Broadway, N. Y.
Coulter, M. S., Logansport, Ind.; *Spec. Trees.*
Dunkle, A. W., Vernon, Ind.
Feay, Dr. Wm. T., Savannah, Geo.
Geddes, Prof. Wm. N., Williamsport, Pa.
Halway, Edw. W. D., Decorah, Iowa. *Ex.*
Hitchings, E. H., 40 Chamber St., Boston, Mass.; *spec. Filices. Ex.*
Holmes, Jas. P., Minneapolis, Minn.; *Ex.*
Lee, L. Wilmer, Browntown, Josephine Co., Oregon.
Millington, Mrs. L. A., South Haven, Van Buren Co., Mich.
Roe, Miss Mary W., Clyde, Wayne Co., N. Y.
Spence, Mrs. E. J., Springfield, Ohio, *Ex. Filicees and Musci.*
Thompson, David L., Plainfield, N. J.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ *P. M. Botanists are invited to attend.* DR. THURBER, *the President of the Club, may be found at* 245 *Broadway.*

§ 111. **Sudden appearance of plants.**—A few days since, while botanizing on the shores of the Delaware River below Philadelphia, I found a tract of meadow land, several acres in extent, which had been filled in with mud dredged from the river, and growing on it a great variety of plants, such as are usually found along river shores, Polygonums, Chenopodiums, Amarantus, Atriplex, Acnida, &c., &c., many of which had attained an unusual size. A species of Acnida was observed which measured 6½ inches in circumference at the base. Polygonum orientale was growing in great abundance, more plants I think than I had ever seen before, during 15 years botanizing. Some of them were more than 10 feet in height, and branching in all directions, the main stem from 4 to 6 inches in circumference, many of the leaves would measure 10 to 12 inches in length. Growing with Polygonum orientale was Cleome pungens, a West Indian plant, though occasionally met with in gardens. Charles F. Parker had previously called my attention to these two plants growing together on the river dredgings, he having found them both in great abundance two years ago. It is difficult to account for the presence of the Cleome here, except that the seeds must have been in the mud when dredged up, as there was no probability of its having been planted, and there are no gardens anywhere in the neighborhood from which it might have escaped. There are several large sugar refineries on the river above the place, and it has been suggested that seeds may have been introduced in the importations from the West Indies, and with other waste material washed into the river, in turn to be brought up as above. It does not seem likely to maintain itself in the locality, as I found but a limited quantity. Mr. Parker says, when he first observed it there was an abundance of specimens. Has anybody observed the growth on river-dredgings elsewhere? ISAAC C. MARTINDALE.

CAMDEN, N. J., *August* 8, 1876.

§ 112. **Opuntia vulgaris a New Jersey plant.**—In June last I collected near Haddenfield, N. J., an Opuntia in full flower, which, on comparing with the figures of O. vulgaris and O. Rafinesquii in volume 4 of the Pacific Railroad reports, I was satisfied was O. vulgaris; after the fruit became fully developed, I again examined it with the same conclusions. As there had been so much controversy about the Opuntia of New Jersey, some claiming that the O. vulgaris did not occur in the State, but that all was O. Rafinesquii; I forwarded a fresh specimen to Dr. George Engelmann at St. Louis, and have his reply now before me, dated August 7th, in which he says: "It is Opuntia vulgaris, which I had not seen north of the Falls of the Potomac. The specimen shows clearly the color, bristles, fruit, and leaves of that species; there is no doubt about it. I have in cultivation here (St. Louis) the Eastern mostly spineless O. Rafinesquii, from Massachusetts, New York, Pennsylvania and New Jersey; the O. vulgaris I have only from Falls of the Potomac, and from South Carolina." He adds: "Is your plant a real native?" On that point there can be no doubt. John Gill, who owns the land on which it grows, says it has been there to his knowledge at least 25 years; it is confined to a space not more than an acre in extent, and while it does not incline to spread much, it shows no signs of disappearing.

The O. vulgaris may be distinguished from the O. Rafinesquii by its paler joints, fewer petals, and the minute leaves being shorter, more ovate and appressed. Having now fully identified Opuntia vulgaris as a New Jersey plant, it would be interesting to know whether it may not be found in other localities than the one above mentioned. ISAAC C. MARTINDALE.

CAMDEN, N. J., *August* 12, 1876.

§ 113. **Tilia Americana, L.**—I recently came across a tree of this species in Weymouth, Mass., the leaves of which instead of being acuminate are rounded or even a little notched at the extremity. Has such a form been before observed? H. WILLEY.

§ 114. **Dimorphism.**—I have noticed a decided dimorphism in the flowers of *Bouvardia leiantha*. One form has the stigmas quite exserted and the limb rather narrow; in the other form the limb is broader and the stigmas included. Of course there is a corresponding difference in the position of the stamens. As dimorphism is very characteristic of the Rubiacene I dare say that this observation has been made by other students, only I have never happened to see it. W. W. BAILEY.

§ 115. **South Jersey Fungi.**—Descriptions of some new species found at Newfield, New Jersey, by J. B. ELLIS.

(Continued from Vol. VI., No. 14.)

17. **Helicosporium auratum,** *n. sp.*—On decaying wood of Acer rubrum lying on the ground, October, 1875. Flocci erect, sparingly branched, clavate above, spores with 12–15 convolutions closely coiled into oblong-elliptical masses about .0015′ in length. Color of the whole plant golden yellow. Very minute, appearing to the naked eye like a sprinkling of yellow dust. Structure of the spores the same as in H. ellipticum, *Pk.* Found but once and very sparingly, but apparently quite distinct.

18. **Sphæronema hispidulum,** *n. sp.*—On dead branches of Nyssa multiflora, October. Perithecia scattered, linear-clavate, acute, black, under the lens minutely hispid-pubescent, about $\frac{1}{20}$′ high. Spores linear-lanceolate, curved, 8–10 septate, of a pale yellowish tint except the acute hyaline extremities, .0025′×0002′. Globule of spores whitish, base of the perithecia somewhat enlarged and clothed with longer softer hairs.

19. **Sphæronema hystricinum,** *n. sp.*—On dead Viburnum, mature in June. Perithecia about one line high, cylindric-subulate, acute, transversly rugose, nearly black but with a faint rufous tinge especially when moist. Spores hyaline, arcuate, narrow, acute, 3–4 nucleate, 001′ long, or with the pedicel, which often remains attached to one end, .0015′. Terminal globule minute, hyaline or with a faint tinge of rose color. The stems and branches on which this fungus occurs are covered so thickly by it as to appear hispid. The tip of the spores is acute but not prolonged as in the preceding species.

20. **Sphæronema stellatum,** *n. sp.*—On dead stems of Ilex glabra, May. Perithecia cespitose, ovate-conic, acute, apices subrufous. Spores elongated, arcuate or the extremities curved in opposite directions, .0015–002′ long, with a row of nuclei. Resembles S. cespitosum, *Pk.*, but the elongated spores attenuated to a point at each end are very different.

21. **Sphæronema nigripes,** *n. sp.*—On bark of dead Acer rubrum with Stilbospora ovata, *Pers.*, October. Erumpent. Perithecia small, piercing the epidermis with a pale, slender, uneven, subulate beak, about $\frac{1}{20}$′ long. Terminal globule hyaline minute. Spores oblong, obtuse with 1–2 globose nuclei, nearly hyaline, 0006′–0008′ long. The base of the beak or ostiolum in all the specimens was blackened by the Stilbospora spores.

22. **Sphæronema Clethrincola,** *n. sp.*—On dead Clethra alnifolia, July. Perithecia erumpent, scattered, obtuse-conic or at length cylindric with an enlarged base. Globule white, becoming subrufous. Spores oblong, hyaline, minute, not over .0002′ long. Not to be confounded with S. Magnoliæ, *Pk.*, or S. minutissimum, *Pk.*, to both of which it bears some resemblance.

23. **Sphæronema rufum,** *n. sp.*—On the smooth cut surface of a trunk of dead Magnolia glauca, Perithecia superficial, subulate, minute, about $\frac{1}{2}$″ high, rufous, paler above, globule hyaline. Spores minute, nearly globose. Sporophores tufted, straight, about .001′ long.

24. **Sporidesmium rude,** *n. sp.*—On living leaves of Magnolia glauca, October. Punctiform, crowded or scattered on brown spots on the upper surface of the leaves. Spores briefly pedicellate, brownish, varying greatly in size, oblong subcylindric, 1–7 septate and mostly slightly constricted at the septa, each division containing two or more nuclei and some of them divided by a longitudinal septum. *Mycotheca Universalis, No.* 475.

25. **Stilbum atrocephalum,** *n. sp.*—On dead Kalmia latifolia, October. Scattered or cespitose, stems pale, about one line high, simple or branched, head black, ovate or subrotund. Spores yellowish, fusiform-lanceolate multiseptate .001′—0015′ long, almost exactly like those of Sphæronema hispidulum.

26. **Peziza** (Dasc.) **rhaphidospora,** *n. sp.*—On an old pine stump, October—December. Gregarious, sessile, minute, subconfluent, with white, tomentose—plane or slightly convex—asci linear-clavate with their apices either acute or obtuse. Paraphyses simple straight, rather abruptly thickened above. Sporidia filiform, as long as the asci, with a row of nuclei.

27. **Peziza** (Mollisia) **mycogena,** *n. sp.*—On old Polyporus igniarius buried in the leaves, March. Scattered, minute, fleshy, at length concave with an obtuse margin, pale with a greenish tinge. Sporidia uniseriate, elliptic or oblong elliptic, binucleate or with the endochrome divided so as to appear uniseptate, .0003′—00035′ long. The Polyporus on which this fungus grew was still nearly sound, its tough leathery substance having enabled it to resist the decomposing influences of time while the prostrate trunk of Oak, on which apparently it grew, had entirely decayed.

28. *__Peziza subgibbosa,__ *n. sp.*—On dead stems of Andropogon lying on the ground, October. Scattered, stipitate, minute, not over half a line high, of a dull watery white when fresh, becoming darker when dry. Cup of fibrous texture, hemispheric, faintly striate, covered with a sparing appressed pubescence. Disk convex and paler surrounded by a narrow erect jagged border. Asci 8-spored, cylindric. Paraphyses rather abruptly thickened at their apices, often branched above. Sporidia oblong, obtuse, hyaline, at length triseptate .0008′—001′ long, slightly curved, more or less crowded or over-lapping. According to Dr. Cooke, very near P. vexata, *De. Not.*

29. **Dermatea tetraspora,** *n. sp.*—On dead limbs of Quercus coccinea not yet fallen, March. Erumpent, simple or subcespitose, nearly sessile, margined, about one line broad. Disk plane or slightly concave, dark brown, rough, margin thin and lighter colored. Asci rather short, clavate-cylindric, broad, containing four ovate-oblong brown sporidia .0008′—001′×.0006′—0008′ mostly with a large central nucleus—some of the sporidia are almost spherical, subhyaline at first with a granular endochrome, at length of a clear rich brown. The fungus projects but slightly above the epidermis by which it is closely surrounded.

30. *__Dermatea lobata,__ *n. sp.*—On White-oak limbs lying on the ground but not much decayed, mature in June. Superficial, scattered, globose and closed at first, opening at length and expanding so that the pale glaucous disk becomes convex and the margin lacerate-lobed, rufous brown without and roughened with an innate-squamose coat. Asci cylindric. Paraphyses thickened at the summit, the thickened portion often containing a nucleus. Sporidia in a single series, short-oblong or oval, subhyaline, .0005′—0006′ long and about .0004′ wide. Most of the specimens were entirely superficial, being seated on the epidermis, but a few penetrated to the inner bark.

31. *__Dermatea purpurea,__ *n. sp.*—On dead Viburnum, Feb., 1875.—Rare. Cespitose, erumpent, irregular, dull-purplish-black, mealy, darker within. Asci clavate-cylindric. Paraphyses slightly thickened at the summit. Sporidia shaped like kidney beans, hyaline, obtuse, .0008′×.0003′. Resembles D. furfuracea, but smaller. Unfortunately the insects have nearly destroyed my specc, so that the above notes, taken at the time the specimens were gathered, are all I can at present give.

32. *__Patellaria cylindrospora,__ *n. sp.*—On decaying Maple, Dec. Rare. Scattered, small, black, sessile, thin, shallow, cup shaped, smooth, margin incurved. Disk paler. Asci short and broad clavate, nearly sessile. Paraphyses linear. Sporidia crowded in the asci cylindric, straight or slightly curved, obtuse, with 6–8 globose nuclei, at length septate. Resembles P. lignyota, Fr., outwardly but the sporidia are entirely different.

33. **Hypocrea citrinella,** *n. sp.*—On dead branches of Vaccinium corymbosum, October. Scattered or subconfluent, small, mostly not over one line broad, orbicular, rugose, light lemon-yellow, surface punctate by the minute ostiola. Asci linear. Sporidia hyaline,

ovate oblong, about .0004′ long, the narrower end mostly acute so that they appear more or less wedge-shaped.

34. ***Sphaeria** (Sordaria) **amphicornis,** *n. sp.*—On rabbit's dung, June. Perithecia scattered, superficial, ovate-conic obtuse, $\frac{1}{3}$–$\frac{1}{2}$ a line high, clothed with an erect, dark colored pubescence, composed of obtuse, faintly-septate hairs. Asci 8-spored. Sporidia almond-shaped, greenish at first, at length brown, .0012′×.0005′, with a hyaline appendage at each end about as long as the sporidium—the apical one mostly straight and obtuse, the basal often curved or bent to one side. Resembles Sordaria fimiseda, *Ces. & De Not.*

Boletus squamulosus, Vol. VI., p. 77. This name having already been appropriated (see Fries, New Epicrisis), my plant may stand as *Boletus dichrous.*

§ 116. List of the Marine Algæ growing in Long Island Sound, within 20 miles of New Haven, by F. W. Hall.

[In this list are comprised 95 species and varieties, exclusive of several species which have not been satisfactorily identified. Doubtless many more will be added to the number, especially of those among the fresh water Algæ, of which only a comparatively few species have as yet been studied from this locality.—F. W. H.
New Haven, Ct., *Aug.*, 1876.]

Class. ALGÆ.

Subclass I. MELANOSPERMEÆ.

Order I. FUCACEÆ.

1. **Sargassum,** Ag.—*S. vulgare,* Ag.—On rocks and stones; not common.

2. **Fucus,** L.—*F. vesiculosus,* L. On rocks between high and low water marks.—*F. nodosus,* L. On rocks between high and low water marks.

Order II.—SPOROCHNACEÆ.

Desmarestia, Lmx.—*D. viridis,* Lmx. Light House Point. *Prof. D. C. Eaton, and F. W. H.*

Order III.—LAMINARIACEÆ.

1. **Laminaria,** Lmx.—*L. fascia,* Ag. On rocks and stones.—*L. saccharina,* Lmx. On rocks and stones in deep water; cast ashore.—*L. flexicaulis,* Le Jolis (*L. digitata,* Lmx.). South End, E. Haven. *Prof. Eaton and F. W. H.*

2. **Chorda,** Stack.—*Ch. Filum,* Stack. On rocks, &c.—*Ch. lomentaria,* Lyngbye. On rocks and stones in pools.

Order IV.—DICTYOTACEÆ.

1. **Stilophora,** Ag.—*S. rhizodes,* Ag. Parasitic on *Algæ* in pools; Ives' Point.

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* In determining these species, I am indebted for advice to Dr. Cooke, Editor of *Grevillea.* I have also received valuable aid from Prof. C. H. Peck. My friend W. C. Stevenson has also assisted me by making some careful microscopical measurements.

Errata.—Vol. VI, p. 76, 18th line from the top, for *Pk.* read *Peck.* Same page 16th line from the bottom, for *Viburnum* read *Vaccinium.*

2. **Dictyosiphon,** Grev.—*D. fœniculaceus*, Grev. On stones in pools, and on other *Algæ*. Thimble Islands, *Mrs. Davis.*

3. **Punctaria,** Grev.—*P. latifolia*, Grev. Not very common.

ORDER V.—CHORDARIACEÆ.

1. **Chordaria,** Ag.—*Ch. flagelliformis*, Ag. On rocks and stones and upon *Algæ.*—*Ch. divaricata*, Ag. Parasitic on small *Algæ*, and on stones.

2. **Leathesia,** S. F. Gray.—*L. tuberiformis*, S. F. Gray. *Rare.*

3. **Elachista,** Duby.—*E. fucicola*, Fries. Parasitic on the *Fuci.*

ORDER VI.—ECTOCARPACEÆ.

1. **Sphacelaria,** Lyngb.—*S. cirrhosa*, Ag. Thimble Islands, &c.

2. **Ectocarpus,** Lyngb.—Several species of this genus have been collected, but not, as yet, satisfactorily determined: however, they will probably comprise *E. firmus*, Ag. (*E. littoralis*, Harv., *in Ner. Am. Bor.*); *E. siliculosus*, Lyngb.; *E. viridis*, Harv., &c.

SUBCLASS II. RHODOSPERMEÆ.

ni

ORDER I.—RHODOMELACEÆ.

1. **Chondria,** Ag.—*Ch. dasyphylla*, Ag. On other *Algæ*, &c.—*Ch. Baileyana*, Mont. (*C. striolata*, Ag.) On *Algæ*, &c.—*Ch. tenuissima*, Ag. On *Algæ*, stones, &c.

ni 2. **Rhodomela,** Ag.—*R. subfusca*, Ag. On rocks and stones; rather rare; and *var. Rochei* (*R. Rochei*, Harv., *in Ner. Am. Bor.*) On *Algæ* and stones.

3. **Polysiphonia,** Grev.—*P. urceolata*, Grev., and *var. formosa.* On rocks.—*P. Olneyi*, Harv. On *Zostera marina*, &c.—*P. Harveyi*, Bail. Parasitic mostly upon *Zostera.*—*P. violacea*, Grev. On *Zostera*, &c. Falkner's I., and Thimble Is.—*P. variegata*, Ag. On *Zostera*, stones, &c.—*P. nigrescens*, Grev. On shells, stones, &c.—*P. fastigiata*, Grev. Parasitic on the *Fuci*; not common

4. **Dasya,** Ag.—*D. elegans*, Ag. On *Algæ*, rocks, &c., mostly in deep water: thrown up on the shore. (An elegant Alga, appropriately named.)

ORDER II.—LAURENCIACEÆ.

Champia, Desv.—*Ch. parvula*, Harv. On *Algæ*, shells, &c.

ORDER III.—CORALLINACEÆ.

1. **Corallina,** L.—*C. officinalis*, L. On stones, shells, &c. *Prof. D. C. Eaton.*

2. **Melobesia,** Lmx.—*M. membranacea*, Lmx. On *Zostera marina. Prof. D. C. Eaton.*—*M. pustulata*, Lmx. On *Fuci. Prof. D. C. Eaton.*

3. **Lithothamnion,** Phil.—*L. polymorphum*, Lmx.

ORDER IV.—SPHŒROCOCCOIDEÆ.

1. **Grinnellia,** Harv.—*G. Americana*, Harv. On stones, shells, sponges, &c., in deep water; cast ashore.

2. **Delesseria,** Lmx.—*D. sinuosa*, Lmx. Thimble Is., *Mrs. Davis.* Light House Point. *Prof. Eaton, F. W. Hall, and A. H. Young.*

3. **Gracilaria,** Harv.—*G. multipartita*, Ag., and *var. angustissima.* On stones, &c.

ORDER V.—GELIDIACEÆ.

Gelidium, Lmx.—*G. corneum*, Lmx., *var. crinale.* On rocks, &c.; somewhat rare.

ORDER VI.—SPONGIOCARPEÆ.

Polyides, Ag.—*P. rotundus*, Grev.

ORDER VII.—RHODYMENIACEÆ.

1. **Rhodymenia,** Grev.—*R. palmata*, Grev. Madison, Ct., Falkner's I., off Guilford, and New Haven, Ct.

2. **Rhabdonia,** Harv.—*R. Baileyi*, Harv. (*R. tenera*, Ag., *Solieria chordalis*, Harv., *in Ner. Am. Bor.*)

ORDER VIII.—CRYPTONEMIACEÆ.

1. **Phyllophora,** Grev.—*Ph. Brodiæi*, Ag.—*Ph. membranifolia*, Ag.

2. **Ahnfeldtia,** Ag.—*A. plicata*, Fries.

3. **Cystoclonium,** Kütz.—*C. purpurascens*, Kütz. On *Fuci*, &c.

4. **Chondrus,** Stack.—*Ch. crispus*, Lyngb. On rocks between tide marks.

5. **Chylocladia,** Grev.—*Ch. Baileyana*, Harv. Deep water; thrown up on shore.

ORDER IX.—SPYRIDIACEÆ.

Spyridia, Harv.—*S. filamentosa*, Harv.

ORDER X.—CERAMIACEÆ.

1. **Ceramium,** Lyngb.—*C. rubrum*, Ag. On other *Algæ*, *Zostera marina*, &c.—*C. strictum*, Harv. On *Algæ*, *Zostera*, &c.—*C. arachnoideum*, Ag., *in Ner. Am. Bor.* (*C. fastigiatum*, Harv.) On *Algæ*, *Zostera*, &c.

2. **Ptilota,** Ag.—*Pti. elegans*, Bonnem. On rocks and *Fuci.*—*Pti serrata*, Kütz. Thimble Is. *Mrs. Davis:* only once found.

3. **Griffithsia,** Ag.—*G. corallina?* Ag. (*G. tenuis*, ——.) On *Zostera*, &c.; not common. There is much doubt as to the correct name of this species; it not yet having been sufficiently studied.

4. **Callithamnion,** Lyngb.—*C. Baileyi*, Harv.—*C. Borreri*, Ag.—*C. byssoideum*, Arn.—*C. corymbosum*, Ag. On *Zostera*, &c.—*C. versicolor*, Ag., *var. seirospermum*, Harv. (*C. seirospermum*, Griff.)—*C. Americanum*, Harv. Not uncommon: a most delicate and beautiful species.—*C. cruciatum*, Ag.—*C. luxurians*, Ag. (*Chantransia virgatula*, Thur.) On *Zostera*, &c.

SUBCLASS III. CHLOROSPERMEÆ.

ORDER I.—SIPHONACEÆ.

Bryopsis Lmx.—*B. plumosa*, Lmx. In rock pools between tide marks.

Order II.—ULVACEÆ.

1. **Porphyra**, Ag.—*P. vulgaris*, Ag. On rocks and stones.

2. **Bangia**, Lyngb.—*B. fuscopurpurea*, Lyngb. On rocks, &c.

3. **Enteromorpha**, Link.—*E. intestinalis*, Link. On stones, &c., between tide marks.—*E. compressa*, Grev. On stones, &c., between tide marks.

4. **Ulva**, L.—*U. Linza*, Linn. Rocks, &c.—*U. latissima*, Linn. Rocks, &c.—*U. lactuca*, Linn.

5. **Tetraspora**, Link.—*T. lacunosa*, Chauv. Fresh water streams.

Order III.—BATRACHOSPERMEÆ.

1. **Batrachospermum**, Roth.—*B. moniliforme*, Roth. Fresh water streams.

2. **Lemanea**, Bory.—*L. torulosa*, Ag. On submerged stones; Hamonassett River, Killingworth, Ct., *F. W. H.*

Order IV.—CONFERVACEÆ.

1. **Chætophora**, Ag.—*Ch. endiviæfolia*, Ag.—Fresh water streams.—*Ch. pisiformis*, Ag. Fresh water streams and ditches.

2. **Draparnaldia**, Bory.—*D. glomerata*, Ag. Fresh water rivulet, New Haven, *Prof. D. C. Eaton.*

3. **Cladophora**, Kütz.—*C. arcta*, Dillw. On rocks in pools.—*C. rupestris*, L. On rocks.—*C. lanosa*, Roth. On rocks; not common at New Haven.—*C. refracta*, Roth. In tide pools, &c.—*C. albida*, Huds. On stones and *Algæ*.—*C. Rudolphiana*, Ag.

4. **Conferva**, Link.—Several species of this genus are found here in fresh water streams, &c., but not yet determined.

5. **Spirogyra**, Link.—At least two species have been found here in fresh water streams, by *Prof. Eaton.*

6. **Chœtomorpha**, Kütz.—*Ch. sutoria*, Berk.—*Ch. longiarticulata*, Harv. Rock pools, Thimble Is., *Prof. Eaton.*

7. **Hormotrichum**, Kütz.—*H. Younganum*, Dillw. On stones, &c., Savin Rock; not common.

Order V.—OSCILLATORIACEÆ.

1. **Lyngbya**, Ag.—*L. majuscula*, Harv.

2. **Calothrix**, Ag.—*C. confervicola*, Ag. Thimble Is.—*C. scopulorum*, Ag. Thimble Is.

3. **Oscillatoria**, Vauch.— ———, on stones in Mill River. *Prof. D. C. Eaton.*

Order VI.—NOSTOCHINEÆ.

Nostoc, Vauch.—*N. sphœroides*, Rab. Pools; Whitneyville, Ct., and Beaver Meadows. *Prof. D. C. Eaton.*

Desmidiaceæ and **Diatomaceæ**.—These orders have not yet been studied.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ *P. M. Botanists are invited to attend.* Dr. Thurber, *the President of the Club, may be found at* 245 *Broadway.*

§ 117 **Aspidium Thelypteris,** *Swz.*—I have several times found specimens of this fine fern—usually described as pinnate and, by some authors, as bipinnatifid only—that were distinctly bipinnate with pinnatifid divisions, and now Mrs. Rust sends to me, from Syracuse, N. Y., some remarkable specimens that not only are bipinnate, but have the pinnules cut so near to the rachis as to make the fronds appear tripinnate with the divisions again pinnatifid.

The specimens were found growing in the shade of deep woods —probably in a place that remains submerged with water through the winter and early spring months,—and, as usual with this fern when growing in such situations, were wholly barren. The species would not have been readily recognized from these specimens but for the character of the root, and the presence of one or two small fronds. The largest specimen—which measures 20 inches across the lower triangular-shaped divisions—is ternate, and resembles Pteris aquilina in its broadly triangular outline, rigid stipe and stalks; but the root, texture and venation are clearly that of A. Thelypteris.

I am inclined to regard these specimens as an unhealthy condition of the plants rather than as a variety, and take it the explanation of the phenomena is to be found either in the exhaustion of the vital energies of the plants through a lack of some necessary element of food in the soil, or in a change of conditions by which they are surrounded. The roots were particularly weak—not having strength enough to support the fronds in an erect position—and indicate the gradual extinction of the species in a locality where at some time it may have been abundant and vigorous. Possibly, if transplanted to some new locality, they might recover their normal condition; otherwise they will be likely to die out altogether. To test this I have planted two roots, and, if they survive, may be able another season to report results. GEO. E. DAVENPORT.

Boston, *September* 15, 1876.

§ 118. **Notes.**—Having several pots of garden Petunia in my windows, I noticed that many small flies were caught in the glandular hairs of the leaves and stems. I watched the fate of the insects as well as I was able. I never found that any escaped. If they struggled much, the viscid matter of the glands was drawn about and over them, like a web or a tangle of fine roots. Then, after some weeks, the legs and wings gradually disappeared, and finally the trunk, leaving the heads for a long time, nor can I say what finally became of these. The hairs of the plant before contact with the insect were of pellucid green, but, in all cases, became discolored for a little distance around the insect, turning brown but not withering. The insects were from one to two-twelfths of an inch in length. Once a much larger fly was caught and struggled in vain for half a day finally dying. But I lost sight of him. I am not able to form an opinion as to whether the insects were absorbed by the glands, but of the facts reported I am quite sure.

Is it unusual for the Ericaceæ to be spontaneously propagated by seed at the present time? I have lived many years in near neighborhood to Kalmia, Azalea, Epigæa, Chimaphila, Gaultheria, Pyrola and the Vaccinieæ without discovering a seedling plant. Is this fine old family decadent? One does not like to think so; it is so cleanly, fastidious, retiring and unweedy in character, and no changling, but adhering with precision to its lovely forms of flower, and its sculpturesque fruit.

Circæa Lutetiana with red sepals was found by Mrs. M. H. Dunton, in Westminister, Vt., on September 30th. The locality was a clearing in the woods where the leafage was extremely bright, and all the vegetation seemed charged with color. Even the involucral scales of the Asters were bordered and tipped with purple. In the same locality, and at the same time, Gaultheria procumbens was found in flower, and in one case the little white bells were clustered above the bright berries on the same stem.

ANN E. BROWN.

Bellows Falls, Vt.

§ 119. **Spurious Fungi.**—A suspicion, which we have long entertained, that the objects on leaves of *Solidago* and *Aster*, described as fungi by Schweinitz under the names of *Rhytisma Solidaginis* and *R. Asteris*, were of insect origin has recently been confirmed by Prof. Riley, to whom we sent specimens. He writes us that they (at least the ones on Solidago) are *galls* made by *Cecidomyia carbonifera*, O. S. "It is a very common gall and white when fresh. The *Cecidomyia* larva is much infested with parasites which are more often bred from the gall than the true maker."

W. R. GERARD.

§ 120. **Publications.**—1. *L'age d'un arbre a-t-il une influence sur l'epoque moyenne de sa feuillaison?*, by A. De Candolle. In studying this problem M. De Candolle availed himself of two methods: The first was the comparison of trees, young and old, of the same species, and in the same locality. In this he was assisted by competent observers; M. Decaime, at Paris, and M. Caruel, at Pisa. He finds, as the result of this method, that it gives some probability to the idea that the appearance of the leaves is somewhat retarded as the tree advances in years, but the evidence, he thinks, is insufficient. His second method was that of prolonged observations on one and the same tree. There are two sets of these observations: the one on two Horse-chestnuts in Geneva, the other on a Grape-vine at Ostend. A careful record of the earliest foliation of the Geneva trees had been kept by different observers: in the case of one for 68, and of the other for 57 years. The vine has been observed for 33 years. After a careful discussion of the records M. De Candolle concludes: 1. That for the majority of arborescent species, the horse-chestnut in particular, there is no reason to suppose that, *ceteris paribus*, the foliation is advanced or retarded with years, at least in the case of trees from 50 to 180 years of age. 2. For some species, and according to the observations of M. Caruel by the first method, and in the care of the vine of Ostend, the foliation appears to be retarded by age; but the first method is unsatisfactory, and the vine was observed for a shorter time than the two trees, and was, besides, subject to pruning and other culture.

3. Young trees are often in advance of those of the same species of 20, 30, or 40 years of age, a circumstance which may be owing to the proximity of the soil or other local influences independent of age. 4. The buds at the top of a tree frequently open after those of the lower part, owing, perhaps, to their remoteness from the roots or to a difference in the temperature of the air above and below in spring. 5. In fine, in comparing the epochs of foliation of a species in different countries or different years, the influence of age is of little or no account relatively to the influence of climate. — 2. The *American Naturalist*, Sept. and Oct.: Dr. Gray has an appendix to his note on Schœnolirion, on occasion of the rediscovery of *S. album*, Durand, in California. *Abies subalpina*, Engelmn., is the provisional name for what seems a new species, discovered by Mr. L. F. Ward, in the highest wooded regions of the Rocky Mts.—3. *The Botanical Bulletin:* In the October No. is an interesting account of a "jungle of herbs that have assumed forest-like proportions" on the bank of the Ohio at Hanover, Ind. *Ambrosia trifida*, twenty-two feet high; *Polygonum Pennsylvanicum*, six feet. In this No., the last of Vol. I., the editor bids farewell to the present title. We take this opportunity to thank him for the honorable courtesy which has prompted the change of name. We trust the BOTANICAL GAZETTE, with its increased number of pages, will meet with the success desired and deserved. It is published at Hanover, Ind., by John M. Coulter.— 4. *Programme of the International Horticultural Exhibition in* 1877 *at Amsterdam:* This exhibition promises to be of the greatest interest. The *Programme* may be had on application, post-paid, to Mr. H. Groenewegen, 5, Oetewalerweg, Amsterdam, Holland.—5. *Catalogue of the Library of Adolphe Brogniart*, to be sold at auction in Paris, Dec. 4th, prox. It is seldom that so good an opportunity is offered to supply deficiencies in a botanical library. Apply to E. Deyrolle, fils., 23, rue de la Monnaie, Paris.

§ 121. **New Localities.**—*Asplenium viride*, Huds., has been discovered by Mr. C. G. Pringle on Mt. Mansfield, Vt.—*Viola rotundifolia*, Mchx., Bristol, Bucks Co., Pa., I. C. Martindale.—*Crepis aurantiaca*, found by Mr. Arnold Green at Warren, R. I., some two years since, vid. BULLETIN, V., 32, has since been discovered by Messrs. Battey and Bailey in Providence. Mr. Bailey also found this summer at Fresh Pond, Cambridge, Mass., *Polygonum Hartwrightii*, Gray, the new species so like P. amphibium. *Senecio viscosus*, L., found by Mr. Congdon on the wharves in Providence, 1875, is reported by Mr. A. Green as fully naturalized, and growing in great quantities near Bullock's Point, on the Prov. Warren & Bristol R. R.—*Galeopsis Ladanum*, L., has recently been detected on Staten Island. Mr. Jos. Schrenk finds *Tunica Saxifraga*, Scop., by roadside at Flushing fully established, and likewise *Ranunculus Ficaria*, L., at College Point, and at Flushing, on a hummock in the swamp, what he cannot but consider as *Alnus glutinosa*, Gært., apparently spontaneous. Mr. Davenport has sent us a specimen of the *Cystopteris fragilis* of Mr. McKay, which he finds a not unusual form.

§ 122. **Appearance and disappearance of plants.**— * * * A part of our river (the Charles) is laid bare for mill repairs once a year, giving a fine chance to look for rare water-plants. After searching many seasons in vain for Isoetes, I at last found the bottom of a canal covered like a field of grass with one species. This season there is little of it, but in its place a small Chara, *Nitella gracilis*, Sm. So of *Utricularia gibba*, L.: after years of search, I found it right in my most frequented path, covering half an acre of wet meadow land so completely that I could not step without crushing the beautiful little yellow flowers. *Polygala polygama*, Walt., has always been rare in this vicinity, but one year it came in on a sandy roadside, covering the ground with the finest plants I have ever found. Neither of these plants has again been seen on the same ground. I searched ten years for good specimens of *Rhexia Virginica*, L., for my herbarium, when, as if by magic, an acre of ground was all ablaze with it. These lasted two or three years and disappeared. The same might be said of *Drosera longifolia*, L., and several other plants. W. EDWARDS.

South Natick, Mass.

§ 123. **Opuntia vulgaris,** Mill.—Since my note in the last No. I have examined Opuntia vulgaris from Harper's Ferry, Va., and O. Rafinesquii from Illinois, both in cultivation by Thomas Meehan, Germantown, Pa., with judgment confirmed. I have also received specimens of O. Rafinesquii from Woodbury, N. J., from the same kind of soil as the Haddenfield specimens. These bear tubers on the roots as mentioned in Vol. IV. of the Pacific R. R. Reports in the case of O. fusiformis, a form of O. Rafinesquii. I have not succeeded in finding tubers on O. vulgaris, and the published description makes no mention of them. I. C. MARTINDALE.

§ 124. **Coplay, Lehigh Co., Pa.**—I notice that the southern limit for *Aspidium acrostichoides*, Swartz, var. *incisum*, as given by Mr. Edwards' Catalogue of North American Ferns, is New York. I take pleasure in stating that it has been found growing in Lehigh Co. by Mr. P. A. Lantz, of Saegersville, who favored me with a fine specimen. I have found here this season *Eriophorum gracile*, Koch, and *Rhyncospora alba*, Vahl. Are these plants common to Southern Pennsylvania? I have not found them as yet in any other locality hereabouts. A. F. KROUT.

§ 125. **Supplement to the Directory—Additions and Corrections.**—

Allen, Dr. T. F., 10, E. 36th St., New York.
Bechdolt, Robert, Bethlehem, Pa.; *not active.*
Hess, Dr. R. J., Bethlehem, Pa.; *removed.*
March, W. T., Spanishtown, Jamaica, W. I.; *deceased.*
Rose, Miss Mary W., not *Roe*, Clyde, N. Y.
Ruger, M. C., 54, Tompkins St., New York.

ERRATA.—P. 109, read "Fucus vesiculosus"; p. 111, lines 8 and 9, read "Rhodomeniaceæ," and "Rhodomenia."

Terms—One Dollar per annum beginning with the January number, 12 *cents for postage. For the Botanical Directory* 30 *cents. Supplement to Directory,* 10 *cents. Vols. I–V., with index, and photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club,* 25 *cents. Address,* WM. H. LEGGETT, 224, *E. Tenth Street, New York. Money Orders on Station D., P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at* 245 *Broadway.*

Vol. VI., No. 23.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Nov., 1876.

§ 126. **The Eccentricity of the Pith of Rhus toxicodendron.**—This subject was briefly discussed at the April meeting of the Club, by Mr. J. B. Hyatt, who seems to have been the first to notice the fact. (BULLETIN, Vol. VI., p. 47.) An article on the subject, written by Lester F. Ward, had appeared in *The American Naturalist*, for that month.

Mr. Hyatt attributes this eccentricity to the heat which the Rhus receives from its support on the inner, or supported side.

Mr. Ward leaves the question somewhat open, though he intimates quite strongly his conviction, that it is due to absorbtion of nourishment by the aerial rootlets; that these rootlets are parasitic, and that they deposit the nourishment, which they collect near the point of their emission from the stem. At least, after detailing his numerous examinations of different specimens of the plant under widely varying circumstances, he says, "these facts all unite in pointing to a physical connection of some kind between the penetration of the rootlets and the eccentricity of the pith. The notion thus far entertained, and which has found its way into our standard text-books, that these rootlets are not for absorbing nourishment, but for climbing, may, in future, require some modification." Anticipating the objection that these rootlets are neither parasitic, nor merely for climbing, but true roots, finding "congenial soil in the corky layer of bark, in the soft mass of decomposed wood, and even to some extent in the minute cryptogamic vegetation that always exists among them, even when clinging to walls of brick or stone," he is at a loss how to account for "the strange eccentricity of the annual rings"

Neither of the foregoing explanations is satisfactory to my mind. That of Mr. Hyatt is exceedingly unsatisfactory, because, if true, all climbing plants closely fixed to supports larger than themselves, should show the same eccentricity to a greater or less extent, directly in proportion to the heat absorbing power of such support. Facts, however, are not in harmony with any such conclusion. I have examined a number of climbing plants with reference to this point with a negative result in every case.

Eccentricity of pith I found in Rhus toxicodendron, Ampelopsis quinquefolia, and, in the only specimen examined, Hedera Helix (English Ivy), but in neither of these have I been able to trace any apparent connection between the degree of eccentricity, and the amount of heat which the plant received from its support In Ampelopsis quinquefolia the eccentricity seems quite variable, being sometimes on the inner, sometimes on the outer side. In the greater number of instances, however, the thickest growth was on the unsupported side, or exactly the reverse of the condition found in Rhus toxicodendron. In the single case of Hedera Helix examined, the thickest growth was on the supported side. The plant was growing up the north face of a ledge of rocks, where the rays of the sun could never reach it. This, it will be remembered, is a root climber.

In Celastrus scandens, a woody twiner, the pith is always centric, unless, by the growth of the supporting tree, pressure is made upon the inner side, when it becomes flattened. In other words, when the pith is eccentric, it is so from a mere mechanical impediment to the natural growth, which affects it in the same manner, and to the same extent, as it would any other plant, not a climber. Mr. Ward's examinations incidentally furnish the same results. For instance, he says he always found the eccentricity less in specimens growing upon stones than in those upon trees. Now, when we consider the amount of heat absorbed by stones in the day-time, during the growing season of plants, and that this is radiated during the night, it becomes evident that a plant growing in such a position, will be in a more equable temperature, and a higher one, than one climbing a tree trunk. It should, then, if Mr. Hyatt's theory be true, show greater eccentricity of pith, whereas it shows less.

One of the best marked specimens of eccentricity which I have was found on the north-west side of a tree trunk, near its base, where the sun could never reach it.

The growth of plant stems generally does not depend upon the heat which they directly receive. The conditions necessary are sufficient nourishment at the roots and sufficient light and heat for the leaves to elaborate this food; these conditions being present, the storing up of the products of vegetable digestion will go on in the stem. Gray says, "The greater the development of vigorous branches on a particular side of a tree, the more wood is formed, and the greater the thickness of the annual layers on that side of the trunk." *

These arguments seem to me sufficient to warrant the rejection of Mr. Hyatt's theory.

Whether the rootlets are, or are not, parasitic, as Mr. Ward inclines to believe them, may now be considered. We have as negative evidence against their parasitic nature, no recorded instance of their ever having been traced to the cambriun of a living support. On the other hand, in addition to the reasons which Mr. Ward gives for their being collectors of nourishment, either as parasitic or true roots, there is the fact that when climbing a support, the plant attains a much greater size than when unsupported. This, at first sight, appears to be a good reason for thinking that the plant may receive other nourishment than that furnished by its roots that penetrate the earth. This, however, I hope to show, is only apparent, not real. But first let us grant, for the sake of argument, that these rootlets do collect nourishment. Then they cannot accomplish this in a parasitic way, because the plant will grow as high, as large, and spread as extensively upon a dead tree as upon a living one. This could not occur if the plant were, in any degree, parasitic. So, then, if the rootlets do collect nourishment they must do so in the character of true roots. Let us see where such an hypothesis would lead. It would inevitably bring us to the conclusion that Rhus toxicodendron puts forth true roots in the great-

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* Structural and Systematic Botany. Note on page 130.

est possible profusion in those situations where there is the least possible nourishment. In other words, it would require us to believe that this plant has the laws that generally govern root-growth reversed in its favor. Now I have repeatedly observed that this plant, lying prostrate upon the ground, roots in just about the same manner, and to the same extent, as any other ordinary plant would root under the same circumstances. Stems growing in such situations, have their pith centric. A large number of plant stems will strike true roots freely in the presence of moisture, and, when surrounded by proper nourishment, these roots will increase extensively. Rhus toxicodendron being no exceptive to this rule, can it be believed that it will, in the absence of these conditions, root a hundred times more freely? I have no hesitation in rejecting a theory which demands such credulity.

If, then, these rootlets do not collect nourishment in any manner—and, if my reasoning be correct, they do not—any theory to account for the eccentricity of pith, founded upon such office, necessarily falls to the ground. How, then, shall we account for it? I think we shall arrive at a solution of that question when we have solved one which should have preceded it, and that is in response to what stimulus do these innumerable rootlets issue?

Dr. Bigelow in his "Medical Botany," published in 1820, says he has "observed that young plants of Rhus radicans frequently do not put out rooting fibres until they are several years old, and that they seem, in this respect, to be considerably influenced by contiguity of supporting objects." Mr. Ward mentioned a "vine upwards of an inch in diameter at the base" which "had climbed a cedar tree to the top, and, no longer finding anything to adhere to, sent out free fruiting branches nearly half an inch thick." Later on he says, "On the projecting branches of the same vine, bearing the berries and *showing no tendency to cling, there was no appreciable eccentricity.*" Here we have at the top of a tree which the plant had climbed, free branches half an inch thick without rootlets. This goes to confirm Dr. Bigelow's remark concerning the influence of contiguity of supporting objects. I have made numerous observations upon this point, and all tending to establish the principle that contiguity of supporting objects is the main factor in the causation of the emission of rootlets. One instance only will I mention particularly. A vine about an inch in diameter had climbed the perpendicular face of a large rock, on its north side, adhering very closely. At the top it branched extensively, some of the branches being nearly half an inch in diameter, and, ascending from the rock, looked very much like a bush growing there. All of these ascending branches, even to the largest, were very nearly free from rootlets. In cases where the stem had at any previous time adhered, and the union had been broken, I noted both a tendency toward recovery from eccentricity of pith, and a marked diminution in the production of rootlets as compared with those adhering portions of the stem both above and below. These facts, to my mind, demonstrate conclusively that Rhus toxicodendron is stimulated to put forth rootlets for climbing, by contact with a supporting object, in just the same manner as it, in common with many other plants, is stimulated by contact with moist earth to put out true roots. That very many plants possess an irritability which responds to the stimulation of contact is a well-known fact. Those which respond by movements perceptible to the eye may be passed with a mere mention, while we consider some of those more directly bearing upon the question which we are discussing. Tendril bearers show this irritability in a marked degree, as also do the petioles of leaf climbers. So necessary is this stimulation to the tendrils of Ampelopsis quinquefolia that they wither and die without it; upon grasping an object, however, they increase in strength, become woody, and retain their hold for years.

Darwin, in his work on "Climbing Plants," details a great number of curious and interesting experiments which amply demonstrate this irritability and its effects. In speaking of the genus Clematis, he says, "When a petiole has clasped a twig it undergoes some remarkable changes. * * * The clasped petiole in the course of two or three days swells greatly, and ultimately becomes nearly twice as thick as the opposite one which has clasped nothing. When thin transverse slices of the two are placed under the microscope their difference is conspicuous; the side of the petiole which has been in contact with the support is formed of colorless cells with their longer axis directed from the centre, and these are very much larger than corresponding cells in the opposite or unchanged petiole." The sensitiveness of the petioles in this genus, however was limited to the younger leaves. Solanum jasminoides gave more decided results. Here he found the petiole of the full grown leaf still sensitive, and, when it had clasped a support, the subsequent changes were still greater. After detailing his examination of this plant, he says, "It is a singular morphological fact that the petiole should thus acquire a structure almost identically the same with that of the axis; and it is a still more singular physiological fact that so great a change should have been induced by the mere act of clasping a support." Many other examples might be presented, but it is unnecessary. The irritability which I claim for the stem of Rhus toxicodendron differs only in degree from the instances just related. This difference might justly be expected when the ends to be attained are considered. In the one case, a short lived leaf petiole is made the sensitive organ, and serves its purpose for the time required; in the other, the whole stem is made sensitive in order to support itself for years. It may be urged against this theory that unsupported stems do put forth occasional rootlets. This objection should not be considered valid. The nature of the plant is of course strongly bent toward the production of rootlets, and with this evidently strong predisposition, it need not be considered strange if some are produced without the stimulation which is usually requisite. Some plants put forth adventitious roots from the lower portions of their stems which tend downward and enter the earth, but no one would, on this account, claim that as the normal type of root growth. The rootlets being put forth in response to the stimulation of contact, I consider that eccentricity of pith follows incidentally, and in the following manner; in the absence of special organs, as nerves, to conduct the stimulus of an irritant, in vegetables irritation can only be conveyed from cell to cell, and hence the further a cell is located from the origin of the irritation the less its effect will be felt. Now irritation within natural limits can only serve to increase cell activity and growth. This is just what Darwin found in the cases which I have quoted; and it is just what I should expect to find in the plant under consideration.

In the same manner it would seem reasonable to account for the great difference in size existing between the supported and the unsupported plant. This difference has long been noted, and doubtless Linnæus and others following him founded their different species *mainly* upon that character. In the one instance the plant has, so to speak, every energy brought into full activity, while in the other, one great incitement to full activity is witheld. The former attains its full stature, the latter remains a dwarf.

LAURENCE JOHNSON, M.D.

319, West 26th St.

§ 127. **Fresh Water Algae.**—Collected during the past three years, mostly within a circuit of about twenty miles around Bethlehem, Penn., by FRANCIS WOLLE.

[Thirty species believed to be new to the United States and ten entirely new discoveries are indicated by Italics.]

DESMIDIEÆ.

1. **Palmoglœa**, Ktz.—*P. clamydospera*, de By.
2. **Penium**, Breb.—P. digitis, Breb.—P. Closteroides, Ralfs.—P. interruptum, Breb.—P. *oblongum*, de By.
3. **Closterium**, Nitzsch.—*C. obtusum*, Breb.—C. angustatum, Ktz. —C. striolatum, Ehrb.—C. lunula, Ehrb.—C. Ehrenbergii, Menegh.—C. Leibleinii, Ktz.—C. Dianae, Ehrb.—C. Venus, Ktz. —C. parvulum, Naeg.—C. Jenneri, Ralfs.—C. rostratum, Ehrb. —C. setaceum, Ehrb.—C. moniliferum, Bory.—C. lineatum, Ehrb.—C. acerosum, Ehrb.—C. *turgidum*, Ehrb.
4. **Tetmemorus**, Ralfs.—T. Brebissonii, Menegh.—T. lævis, Ktz.
5. **Pleurotaenium**, Naeg.—P. Trabecula, Naeg.—P. clavatum, Ktz. —P. crenulatum, Ehrb.—P. hirsutum, Bailey.—P. nodosum, Bailey.
6. **Spirotaenia**, Breb.—S. condensata, Breb.
7. **Sphaerozosma**, Corda.—S. excavatum, Ralfs.
8. **Hyalotheca**, Ehrb.—H. dissiliens, Breb.—H. mucosa, Ehrb.
9. **Bambusina**, Ktz.—B. Brebissonii, Ktz.
10. **Didymoprium**, Ktz.—D. Grevillii, Ktz.
11. **Desmidium**, Ag.—D. Swartzii, Ag.—D. Swartzii, *var.* Ralfsii.—D. aptogonum, Breb.
12. **Aptogonum**, Ralfs.—A. Baileyi, Ralfs, finely in fruit.
13. **Cosmarium**, Corda.—C. margaritiferum, Menegh.—C. Botrytis, Menegh.—C. ovale, Ralfs.—C. tetrophthalmum, Ktz.—C. *conspersum*, Ralfs.—*C. Portianum*, Archer.—*C. Ralfsii*, Breb.—*C. læve*, Rab.—C. Cucumis, Corda.—C. pyramidatum, Breb.—

C. quadratum, *var. minus.* Grun.—C. binoculatum, Breb.—C. Meneghinii, Breb.—*C. subcrenatum*, Naeg.—C. crenatum, Ralfs.—*C. retusum*, Perty.—C. ornatum, Ralfs.—C. cælatum, Ralfs.—C. Broomei, Thwaites.—*C. protractum*, Naeg.—*C. orbicalatum*, Ralfs.—C. Thwaitesii, Ralfs.—C. connatum, Breb.—C. connatum, *var. minus*, new var., differs from the typical form mainly in size, being only half as large.

C. dentatum, n. sp.—Frond one-half longer than wide, semicells oval or suborbicular, constriction deep. Cytioderm finely and rather closely set with short conical pearly granules; the margins of the sides of the segments dentate with more distant and larger conical projections, ten to twelve on each side. The ends rounded and devoid of projecting teeth. End view oval. Side view elliptical, with a deep constriction in the middle. Length of frond .0058″—0063.″ Width .0036″—004.″

C. pectinoides, n. sp.—Frond suborbicular, somewhat longer than broad, constriction linear. Segments semiorbicular, undulate on the margins with twenty or more crenulations, roughened with geminate rows of pearly granules symetrically arranged in radiating lines. On green fronds the united twinned granules appear oblong and the crenulations somewhat dentate. Each segment furnished at base with a rounded protuberance most distinctly evidenced by side view. The resemblance to forms of many seaside shells suggested the name. Frond .0025″ long, and .0018″ broad.

14. **Euastrum**, Ehrb.—E. verrucosum, Ehrb.—*E. pectinatum*, Breb. —E. oblongum, Ralfs.—E. ampullaceum, Ralfs.—E. didelta, Ralfs.—E. elegans, Ktz.—E. binale, Ralfs.—E. ornatum, Wood. —E. circulare, Hassel.—*E. rostratum*, Ralfs.
15. **Micrasterias**, Ag.—M. oscitans, *var.* pinnatifida, Ktz. *var. inflata*, new.—M. Americana, *var. recta*, new.—M. Crux-Melitensis, Ralfs.—M. truncata, Breb.—M. furcata, Ag.—M. Jenneri, Ralfs.—M. foliacea, Bailey.—*M. multifida*, n. sp.—M. denticulata, Breb.—M. disputata, Wood.—M. muricata, Ralfs.

Three forms are considered new. M. oscitans, var. *inflata* differs from the typical forms in having the lateral lobes not "narrow and conical" but broad, with sides nearly parallel and often inflated or widened at the ends. M. Americana, var. *recta* differs from the normal form in having the terminal lobe, not "concave and bipartite at the angles," but straight and entire, with two conical tubercles on the margin towards the lateral ends.

M. multifida, n. sp. Frond punctate, five lobed: basal lobe bifid, and middle lobe trifid, and each section again bifid, and by a shorter sinus bifurcate at apices; or, segments may be called eleven lobed; the lateral lobes deeply bisected, sinus more or less rounded at base, sections forked. Terminal lobe narrow, not exerted, sinus wide, angles bifurcate. Rarely with nine lobes. .005″ wide. 005″—006″ long.

16. **Staurastrum**, Meyen.—St. muticum, Breb.—St. orbiculare, Ralfs.—*St. brevispina*, Breb.—*St. Dickiei*, Ralfs.—St. dejectum, Breb.—*St. Avicula*, Breb.—*St. brachiatum*, Ralfs.—*St. bifidum*, Breb.—St. Margaritaceum, Menegh.—St. dilatatum,

Ehrb.—*var.* alternans, Breb.—St. punctulatum, Breb.—St. polymorphum, Breb. — St. cyrtoceron, Breb. — St. paradoxum, Meyen.—St. gracile, Ralfs.—St. hirsutum, Breb.—*St. teliferum*, Ralfs.--*St. Saxonicum*, Bulnh.—St. polytrichum, Perty.—*St. spongiosum*, Breb.—*St. controversum*, Breb.—*St. vestitum*, Ralfs.—*St. oxacanthum*, Archer.—St. furcigerum, Breb.—*St. lunatum*, Ralfs.—St. munitum, Wood. The following four are considered new species.

St. bibrachiatum, n. sp., segments subquadrangular, or cuneate, gradually widening upward, truncate at ends, lateral extremities each tapering into a single, elongate divergent colorless process, rough or denticulate on the margins. Arms two to three times as long as the body. End view elliptical, with a single process at each end, tips obtuse dentate.—.00187″—.00225″ long with arms. .0015″—.0016″ wide.

St. cuneatum, n. sp. Frond as long as wide. Segments broadly cuneate with convex bases, producing in front view deep constrictions between them. Sides converging from the base upward to a truncate end, each with three to six sharp teeth, spaces between them deep inverted crenulations. End view triangular, sides somewhat concave, angles bi-trifid, with six radiating central processes rarely extending beyond the sides. .00175″—00225″ each way.

St. binaculeatum, n. sp. Frond smooth, front view subelliptical, inner margins more convex than the outer, angles with two spines separated at the base. End view triangular, sides slighty concave, angles bluntly rounded with two rather long more or less divergent spines on each. .0015″ long, .002″ wide.

St. cruciatum, n. sp. Frond small, smooth, front view cruciform, the arms mammillare, sinus wide, obtuse angled. End view three or four lobed, each slightly tapering, ends rounded with a number of more or less diverging setae, as long as the lobes, on the ends of each. .001″ without setae.

17. **Xanthidium**, Ehrb.--X. fasciculatum, Ehrb.—ditto *var. antelopæum*, Ktz.—ditto *var. polygonum*, Ehrb.
18. **Arthrodesmus**, A. convergens, Ehrb.

I shall be pleased to hear from any one interested in this subject, especially with a view to add to the knowledge of this kind of plants.

F. W.

§ 128. **A Two Day's Excursion.**—The geology of Grayson County, Ky., at the station called Big Clifty, is peculiarly adapted to the growth of ferns. The sand stone which underlies the surface is quite soft and disintegrates readily. The country is very hilly, and the streams, which at times rise rapidly, have worn their beds into immense gullies. Big Clifty Creek bridge, 62 miles from Louisville, on the Paducah R. R., from cliff to cliff, is one hundred and thirty two feet high. The following is a list of ferns collected in a recent excursion by Major W. J. Davis and myself, within a circle of a radius not greater than two and one half miles. Aspidium acrostichoides, Swartz; A. spinulosum, Swartz; A. spin, var. intermedium; A. Noveboracense, Swartz; A. marginale; Swartz; Adiantum pedatum, L.; Botrychium Virginicum, Swartz; Camptosorus rhizophyllus, Link; Phegopteris polypodioides, Fée; Polypodium vulgare, L.; P. incanum, Swartz; Pteris aquilina, L.; Asplenium pinnatifidum, Nutt; A. Trichomanes, L.; A. ebeneum, Ait.; A. montanum, Willd.; A. angustifolium, Michx.; A. thelypteroides, Michx.; A. Filix-femina, Bernh.; A. Bradleyi, Eaton; Onoclea sensibilis L.; Cystopteris bulbifera, Bernh.; C. fragilis, Bernh.; and Osmunda interrupta, Michx.—twenty-four varieties in all.

A smooth-faced sand stone which had fallen from the cliff on the bank of Meeting Creek, thirty-five feet wide at the base, nearly upright, and thirty feet high, shaped much like a sextant resting on one of the radii, stands facing the north, and is perfectly shaded from the sun by the hills. The face of the rock is covered with most luxuriant Polypodium vulgare—some of the fronds being fully fourteen to sixteen inches in length—to within about two or three feet of the ground, where Camptosorus finds an equally suitable situation for propagation and continuance. I have no doubt, had we been a month or two earlier, we might have added quite materially to our list. Our chief endeavor was to procure three ferns, A. Bradleyi, A. montanum, and Trichomanes radicans, so that the summits of the hills were but imperfectly explored.

I have a few dried specimens of Asplenium pinnatifidim and A. montanum which I would exchange, by mail or express, at my expense, for some of the living roots of rare native ferns.

C. C. Haskins.

New Albany, Ind.

§ 129. **Trees of the United States.**—"*A Catalogue of the Forest Trees of the United States which usually attain a height of sixteen feet or more, with notes and brief descriptions of the more important species, illustrating the collection of forest-tree sections on exhibition by the Department of Agriculture at the Centennial Exhibition, Philadelphia.* Prepared by Geo. Vasey, M.D." Washington, 1876. The Department of Agriculture in making this collection, and in publishing the catalogue has done good service. Very competent persons were engaged to collect. About 400 species are enumerated, the greater portion of which are represented by specimens in the collection. Of Oaks there are about 37 species; of Pines, 35; of other Conifers, 43; of the Rose family, 37; of Leguminosæ, 21; of Ericaceæ, 8; of Maples, 8; Magnolias, 7; Ash, 11; Elms, 6; Walnuts and Hickories, 13; Poplars, 8; and Birch, 6 species. An Anona, or Custard Apple, a Chrysophyllum, or Star Apple, and a Palm, Thrinax, are new to our flora. The Catalogue is a pamphlet of 38 octavo pages, and we presume can be obtained from the Department.

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P. M. Botanists are invited to attend. Dr. Thurber, *the President of the Club, may be found at 245 Broadway.*

§ 130. **Foliation.**—The distinction between deciduous and evergreen shrubs or trees is founded on the observation that the former drop their leaves on the approach of winter or of the dry season, and that the latter keep them till the return of spring or its equivalent the rainy season. Some plants, however, which are deciduous towards the north, are evergreen further south ; while again others, either owing to local shelter or to later determination of the articulation, bear their leaves in whole or in part far into the winter. This is a very general statement of an interesting subject which may be found more fully discussed in text-books, Gray's "Structural and Systematic Botany" for example. But here, as in every other department of science, there is abundant need and opportunity for the systematic accumulation of facts and observations. Not only in the retention or discharge of their leaves, but also in the season of their display do trees differ, and in other points which we purpose presenting on some other occasion. The different habits of species in this respect seem to be less fixed than other characteristics, though durable enough when compared with the life of man, and perhaps the subject of their variation and their more recent geological history may be advantageously approached in this direction. It is noticeable, for example, that the Cladrastis, the Paulownia, the Catalpa, the Ailanthus, the Broussonetia, and other exotic trees which are cultivated about New York for shade or ornament, are later in putting on their foliage than the great body of the natives ; while, on the other hand, the English Elm, the Weeping Willow, the Chinese Wistaria, and many other foreigners, hold their leaves later than the aborigines.

For the purpose of gathering facts on this subject, we intend publishing monthly a Calendar of Leaves, and invite all who are interested in any part of the country to contribute. It is requisite that each contribution should give the name of the observer, the locality, the condition of two or three other trees or shrubs in the immediate vicinity, the date of the observation, and such other notes as may seem of value. Our November calendar is given merely as a specimen :—

§ 131. LEAF CALENDAR.

Nov. 26. **Rosa lucida**, Ehr. ?—Many discolored leaves. A low bush
Rubus villosus, Ait.—Some red leaves on low bushes.
Vaccinium, spec.—Red leaves on low young bushes.
The above were noticed in a wood on Bergen Point, N. J., between New York and Newark bays.—W. H. L.

Prunus Persica, the Peach, was noticed in leaf by Mr. Le Roy, in Westchester Co.

" 29. **Salix Babylonica**, Tourn., the Weeping Willow, alone still retains some foliage in the parks and grounds about the city.

Wistaria Sinensis, Chinese Wistaria, still keeps many leaves where sheltered by walls from the north and west. **Cratægus Oxyacantha**, L., close by one specimen, with equal shelter, was quite bare.—W. H. L.

§ 132. **Publications.**—1. *American Journal of Science and Arts.* Dec., 1876. Dr. Gray notes the re-discovery by Rev. Thomas Morang, on the borders of Winter Pond, Mass., late in September, of *Scirpus supinus*, var. *Hallii* (olim S. Hallii). Mr. Morang also discovered that this plant freely produces solitary female flowers in the axils of the sheaths or short leaves at the base of the culm. Also *Baillon's Dictionaire de Botanique*, of which, with some criticisms, he says: "For those who do not possess a botanical library it should be a boon: for those who do, a great convenience." The work is published in numbers; before subscribing for it, it would be well to read Dr. Gray's notice. Dr. Engelmann has a notice of Stenzel's *Morphology of the Carpellary Scales of Coniferæ.* It seems that the ovule is borne on the back of the scale. As the anther cells are also borne on the lower side of the stamen-scale, we must place the relationship of Coniferæ with Cycadeæ and Ferns, and not with Gnetaceæ or Lycopodiaceæ. We do not gather from this notice what advance Stengel has made on the observations of Van Tieghem, which have been noticed in the *Journal.* Prof. Farlow gives interesting notes on new volumes on Algæ, by Agardh, and Bornet and Thuret.—2. We learn, from the *American Naturalist* for November, that Mr. A. H. Curtiss "proposes to commence a systematic distribution of Southern plants and hopes to receive sufficient aid to enable him to travel for a number of years for the purpose of making the sets as complete as possible. Commencing with large collections made in Florida, Georgia, South Carolina, and other States, he intends to issue three hundred species each winter, keeping an exact record of all specimens sent out, so that those lacking fruit, flowers, etc., may be completed in future years (without extra charge). The price per set of three hundred species will be $25, charges for transportation prepaid by mail or by express to New York. Address A. H. Curtiss, Jacksonville, Fla. "Mr. Curtiss is well known as a skilful collector, who was employed by the Agricultural Department to gather specimens of the trees of the Southern States for the Centennial Exposition." In the December Number of the *Naturalist* is a very interesting account of the discoveries of Mr. C. G. Pringle among the Green Mountains. He found about Mansfield Mt., Woodsia hyperborea, R. Br., Woodsia glabella, R. Br., not only accessible, but safe from extermination in inaccessible places, Pinguicula vulgaris, L., Saxifraga Aizoon, Jacq., in abundance, as also Asplenium viride, Huds., and many other interesting plants, as our readers will find on referring to the *Naturalist.* Mr. W. W. Bailey gives a clear account, for the uninitiated, of the difference between the two Bitter-sweets.—3. *Field and Forest,* November and December, finishes the *Flora Columbiana*, comprising 1083 species down to Lycopodiaceæ inclusive. The Flora is published separately for 15 cents. Address, Columbia Press, Box 273, Washington, D. C. There is an interesting article by Robert Ridgway, on *The Little Cypress Swamp of Indiana.*—4. The *Botanical Gazette*, November and December, John M. Coulter, Hanover, Ind., commences its new volume bravely. Dr. Vasey maintains that his *Festuca Thurberi*, from Colorado, is distinct from the *F. scabrella* described in Hooker's Fl. Bor. Am. Mr. Herbert E. Copeland gives a list of some thirty-five plants of the Dells of the Wisconsin in Central Wisconsin. He thinks the flora of that region indicates a connection with the Atlantic Coast, the Southern States, and the far North-west *Hudsonia tomentosa*, Nutt., *Froelichia Floridana*, Moquin, and others, illustrate the former part of this view, but we do not notice any species particularly characteristic of the latter. However, as botany was only incidental to his visit, the list is imperfect. Mr. Martindale gives a long and generally interesting list of "foreign" plants that have been collected mostly this year in the neighborhood of Philadelphia. Few of these plants seem to have been mere escapes from cultivation, but rather introduced accidentally, and some are getting established. The list was not intended to include the introduced plants mentioned in Gray's Manual, but such plants as *Erodium cicutarium*, *Holcus mollis*, *Linaria Elatine*, etc., are pretty well naturalized, and we wonder that *Potentilla Anserina*, and *Phragmites communis*, and other plants that require very little salt, should be strange to our rival sister. Dr. Garber gives a good account of the *Tillandsiae* of Florida, and C. F. Wheeler has an interesting note on a tendency in *Claytonia Virginica* to heteromorphism.—5. *Check List of the Ferns of North America*, John Robinson, Salem, Mass., Second Edition, with a number of additions and alterations. Prof. Eton has revised the old list and approves this. A handsomely printed list on good paper, broad margins and spaces, and printed only on one side. Besides this there is an edition on thin paper for mailing. —6. *Index Seminum*, etc. A list of seeds, collected in 1876, which the Botanical Garden of Chicago offers for exchange. Six pages, quarto, of three columns, comprising native and foreign plants. List of desiderata to be sent before the first of next March. Address, H. H. Babcock, Director; James Bowen, Gardener, Chicago, Illinois. —7. *Psyche*, Cambridge, Mass., September-November, continues its valuable Bibliographical Record of Entomological articles, and Synoptical Tables for determining N. A. insects.—8. *Cereus grandiflorus and C. Bonplandii*, a medical treatise by R. E. Kunze, M.D., with two fine colored illustrations by Mrs. Annie F. Thomas.

§ 133. **White Mountain Plants.**—Oakes, who made a specialty of these plants, died in 1848, and since then it has been difficult to get a good collection of them without a personal visit to the region, and even then many would be too difficult of access for the lowlander. Messrs. Flint and Huntington have during the past season made collections of more than fifty species, which, carefully arranged and ticketed, will be sent by mail upon the receipt of five dollars. The number of sets is limited to fifty. Address, William F. Flint, Hanover, N. H.

§ 134. **European Exchange.**—Richter Lajos, No. 1, Erzherzogin Marie Valerie Gasse, Budapest, Hungary, sends us a circular, inviting subscription to a society for exchanging the plants of the neighboring countries, Hungary, Transylvania, Croatia, and as far as possible, Turkey and Russia, *for foreign* plants. He requires from each member of the association five francs, say one dollar gold, per annum, to cover expenses, and offers in return 100 specimens in exchange for 100, having regard as much as possible to the wishes of his correspondents. The packages sent to him must be prepaid.

§ 135. Supplement to the Directory—Additions and Corrections.—

Cathcart, Ellen, Stillwater, Minn.
Cleland, E. E., Wilton, Minn.
Curtiss, A. H., Jacksonville, Fla.
Garrison, O. E., St. Cloud, Minn.
Holme, James P., Minneapolis, Minn.
Jenison, S. P., Redwing, Minn.
Leonard, W. E., Minneapolis, Minn.
Newberry, Dr. Edward, 201, E. 34th St., N. Y. *Botanical Artist.*
Newberry, Miss Rose, 201, E. 34th St., N. Y. *Botanical Artist.*
Thomas, Mrs. Annie N., 201, E. 34th St., N. Y. *Botanical Artist.*
Young, Henri W., Galva, Ill.

§ 136. Libraries and Herbaria, I.

We have some notes on these subjects and desire more. It is our intention from time to time to give such an account of these collections throughout the country as may facilitate investigations, and be a guide to visitors to the several localities. We begin at home, with NEW YORK, and the Torrey Herbarium.

The TORREY HERBARIUM and LIBRARY is in one of the buildings attached to Columbia College, on 49th Street and Madison Avenue. To the collection of Dr. Torrey, which is estimated to contain 35,000 species, the *Meissner Herbarium* was added by the liberality of Mr. J. J. Crooke, a member of the Club, and since that the Herbarium of Dr. Chapman has been added by the same enlightened liberality, so that there are now gathered in this one Herbarium, specimens of probably from seventy-five to eighty thousand species of plants. This collection is especially valuable as containing very many typical specimens of American plants, in determining which, as is well known, Dr. Torrey was one of the chief authorities. The sheets, moreover, are often greatly enhanced in value by the fine drawings which Dr. Torrey often made on them, in elucidation of his observations of structure.

The Library is estimated to contain about thirteen hundred volumes in all departments of Botany.

The Herbarium and Library are in charge of Mr. P. V. Le Roy, the Curator appointed by the College, whose courtesy in assisting investigators is well known.

§ 137. **Fern Photographs.**—We have received from Mr. Wm. Edwards, of South Natick, Mass., two beautiful nature-printed photographs of ferns, the one card containing thirty-four North American ferns; the other thirty-three, mostly exotics. The general characteristics of the species are well given, and the cards, when framed, form a handsome picture, about 16 × 14 inches each, without the frame. They may be obtained from Mr. Edwards by sending him one dollar for each, or five dollars for six.

Terms—One Dollar per annum beginning with the January number, 12 *cents for postage. For the Botanical Directory* 30 *cents. Supplement to Directory,* 10 *cents. Vols. I–V., with index, and photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club,* 25 *cents. Address,* WM. H. LEGGETT, 224, *E. Tenth Street, New York. Money Orders on Station D., P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7½ P.M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at* 245 *Broadway.*

§ 138. **Obituary.**—Doctor Joseph Carson died at his residence in Philadelphia on the 30th of December last, at the age of 68. He had long been in feeble health, on which account, last spring, he resigned the professorship of Materia Medica in the University of Pennsylvania, a position he had long and ably filled. Before he was called to this chair he was Professor of Materia Medica in the Philadelphia College of Pharmacy. He was a member of the Philadelphia Academy of Natural Sciences, and of other scientific institutions. As a young man he was an active botanist, if I mistake not, a pupil of the younger Barton, and with the lamented Durand a member of that circle which, a quarter of a century ago, made Philadelphia conspicuous as a botanical centre. When the works of Pererira and Royle on Materia Medica were reprinted in this country, they passed under his supervision, and his accurate botanical knowledge enabled him as editor to correct the numerous errors of the English authors respecting American plants. When a young man, Doctor Carson made numerous contributions to the history of our native medicinal plants, most of which will be found in the earlier volumes of the American Journal of Pharmacy. The cares of his professorship, and a large practice, prevented him in late years from engaging in botanical work, but they did not weaken his sympathy for botanists and their pursuits. The chief ornament of his study was a life size portrait of F. André Michaux, painted by Rembrandt Peale, which, so far as known, is the only likeness of that botanist extant. The many medical readers of the BULLETIN who have been his pupils, and the many botanists who like the writer have in their early studies been encouraged and aided by him, will hold him in pleasant remembrance as a most kind and genial gentleman.
G. T.

"THE PINES," Jan. 25, 1877.

§ 139. Libraries and Herbaria. II.

The NEW YORK STATE HERBARIUM is kept in the "Geological Rooms," on State Street, Albany, and is open to the public for study or consultation. It is intended to represent and illustrate the Flora of this State. It now comprises about sixteen hundred species of Phænogams and twenty-five hundred of Cryptogams. Among the latter are the types of more than three hundred species of Fungi. The Herbarium was commenced by the late Dr. Torrey, who placed in it the greater part of the Phænogamous specimens. Many botanists of the State have generously contributed specimens in the formation of this Herbarium, and all, we believe, take a laudable pride in its increase and preservation. Large additions are still being made to the Cryptogamic part.

The BECK HERBARIUM, formerly the property of the late L. C. Beck, author of Beck's Botany, now belongs to the State, and is kept with the preceding, but distinct from it. It comprises more than three thousand species of Phænogams and above six hundred of Cryptogams. The specimens have been derived from various parts of the world, and among them are the types of several species. Not the least interesting specimens are those collected by Dr. James Eights in the southern part of South America and on the islands of the South Pacific Ocean.

§ 140. **Publications.**—1. *Botanical Contributions*, by Asa Gray, to Proc. Am. Acad. Vol. XII. Dec. 27, 1876. We have here another paper by Dr. Gray, rich in descriptions of new species, and revisions of old points. The first article is on the *Characters of Canbya*, nov. gen. Papaveraçearum, *and Arctomecon*, with two plates, beautifully drawn by Sprague, fit companions for those in the *Genera*. We felicitate Mr. Canby on the fair, and fairly earned, honor, and hope to see his namesake flourishing in cultivation. "From the *Sagina*-like tuft of foliage at the surface of the ground rises a multitude of tiny peduncles or scapes, each tipped with a bright white flower which lasts for many days; the petals (barely two lines long) opening at sunrise and at sunset closing over the ovary, and at length permanently over the capsule, into a globular form, which the discoverer [Dr. Parry] likens to a pearl. The most unexpected anomaly of a persistent (instead of a caducous) corolla is shared by *Arctomecon*, native of the same district, as Dr. Parry himself ascertained upon rediscovering that exceedingly rare plant in the spring of the preceding year." Arctomecon was partly reconstructed for the Botany of California, but, as some new points have since been noticed, a full character is here given. Dr. Gray affirms that the anthers in *Pyroleæ* are in normal position in the bud, *i. e.*, that they are extrose and the pores basal. Other observers have thought differently, and he himself at one time. This is an interesting point for those fond of botanical dissection. Compare Torrey's Flora of State of N. Y., Vol. I., p. 451. It seems that Rafinesque's genus *Steironema*, distinguished from Lysimachia by the presence of staminodia between the fertile filaments, and by the æstivation of the corolla (in which each division is separately involute around, or even convolutely enwraps, the stamen before it), must be re-established, and we must label, instead of *L. ciliata*, *L. radicans*, &c. Steironema ciliatum, S. radicans, S. lanceolatum, and S. longifolium. The next important article is a re-arrangement of Asclepias and the allied genera, in which discussion Dr. Gray has had the aid of important notes by Dr. Engelmann. A curious find is that by the keen-eyed Mr. Green of *Pectocarya*, (Gruvelia) *pusilla*, a Chilian species, east of the Coast Range, therefore far from the coast, abounding in company with the natives of the region. Another Pectocarya (Gruvelia, DC.), P. setosa, *nov. spec.*, has been found by Dr. Palmer in S. E. California. We presume that Dr. Gray's Contributions may be procured from the Naturalist's Agency, Salem, Mass.—2. *Report of the Botanist* (Charles H. Peck) *made to the Regents of the University of the State of New York*, for 1874, published, in advance of the Report on the Museum, in 1876. Mr. Peck has discovered the insects which are laying waste the spruce forests of the Adirondack region, viz., Hylurgus rufipennis, Kirby, the chief agent, and, in one instance, Apate rufipennis, Kirby, a much smaller beetle. It is to be regretted that these reports are not published more punctually, in order that the valuable information contained in them may the sooner be taken into account. Fortunately, in one view, the smaller trees are less liable to attack, so the forests may survive for the generations that will take care of them. Of course the plants new to the state are chiefly Fungi, of which there is a goodly array, this being Mr. Peck's specialty. Of others not previously mentioned in the BULLETIN, we notice *Pyrus sambucifolia*, Cham. and Schl , Adirondack Mts., Mr. Peck ; *Aster amethystinus*, Nutt., Green Island, Albany Co., Mr. Wibbe ; *Habenaria leucophæa*, Nutt., Wayne Co., E. L. Hankensen. Of new localities we have : *Brasenia peltata*, Pursh, in the Adirondack region, V. Colvin ; *Solea concolor*, Ging., New Lebanon, Beck Herbarium ; *Nardosmia palmata*, Hook, Ithaca, Prof. Prentiss, Machias, Wyoming Co., Clinton. *Arceuthobium minutum*, Englm. (A. pusillum, Pk.). Mr. Peck reports this mischievous little stranger from Oswego and Saratoga Counties, making five counties in the State in which it has been found. In all these localities it inhabits Spruces in low grounds or marshes. There used to be some Abies nigra in Secaucus Swamp, if one had leisure, winter would be a good season to investigate it, *Abies balsamea*, Marshall, occurs in Stony Clove, of the Catskills, in a prostrate or ascending bush-like form, Peck ; *Oryzopsis Canadensis*, Torrey, Sandy soil near Center, Peck ; *Milium effusum*, L., Stony Clove, Peck ; *Panicum agrostoides*, Spreng., Northville, Fulton Co., Peck; *Azolla Caroliniana*, Willd., Black Creek near Oneida Lake, Warne. There are two well executed plates illustrating the Fungi.—3. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1876, January–September. That active observer, Mr. Thomas Meehan, seems to be the chief representative of Botany in the Academy. His many observations are always of interest, and his objections to the need of cross fertilization in the case of many plants must needs contribute to the discovery of the truth. Wm. Wood & Co., 61 Walker St., N. Y., and The Naturalist's Agency, Salem, Mass., are agents for the sale of the publications of the Academy.—4. *American Agriculturist*, January and February. Dr. Gray continues his instructive notes on, " How Flowers are Fertilized." From Mr. Darwin's new work, " The Effects of Cross- and Self-Fertilization in the Vegetable Kingdom," he gathers illustrations of the wonderful activity of bees, and their sagacious economy of time. It is well known that humble-bees often bite holes in the flower to get at the honey more expeditiously, that is if the flower is to continue to yield it, but, he asks, " Does any one know of an instance of the perforation of any fugacious flower, any which lasts only one day ? " The Agriculturist always contains some excellent illustrations of plants, besides other matters of interest, and is sometimes a good deal ahead in its botanical news, say from two to nine years.—5. *American Journal of Science and Arts*, January. The first volume of Elliott's Botany bears the date of 1821, the second of 1824, but Dr. Gray shows that the actual publication of the several parts was earlier, beginning in 1816. *Homogone* or *Homogonous*, and *Heterogone* or *Heterogonous* are terms proposed by Dr. Gray, to cover the difference in the relative length of styles and stamens in heteromorphic plants. From a notice of a paper by Mr. Thomas Comber, Hist. Soc. Lanc. and Chesh. Eng., it would appear that in Europe plants with specialized adaptation for fertilization, or dispersion, or endurance, are less widely distributed than the less specialized or lower.—6. *Botanical Gazette*, January: well filled. Mr. Garber gives a racy account of his herborizations in Florida, and Mr. Burgess, of some Iowa plants. Dr. Rothrock, considering that *Diplopappus* must be partitioned out among other neighboring genera, proposes for *D. ericoides*, T. & G., the name of *Aster ericæfolius*, to distinguish it from *D. ericoides*, Less. *Aplopappus ericoides*, DC.—7. *Field and Forest*, January, adds the Mosses to the Flora Columbiana.

§ 141. **International Exchange.**—In October, 1876, at the request of Charles Robinson, Esq., Secretary of the New South Wales Commission of the Centennial Exposition, Rev. Samuel Lockwood, ot Freehold, N. J., shipped to the Botanic Garden, at Sydney, N. S. W., a collection of American aquatic plants. The suite embraced *Nelumbium luteum*, *Nymphaea odorata*, *Nuphar advena*, *Sarracenia purpurea*, *Pontederia cordata*, *Vaccinium macrocarpon*. Excepting *N. luteum*, the plants were all collected by the Doctor around his home. The Nelumbo was obtained at Woodstown, Salem Co., N. J. The plants consisted of roots and seeds, all of which, even the seeds, were packed in very wet sphagnum, in a strong, tight cask, closely sealed up, and expressed by way of San Francisco. Full notes of the habits of the plants were sent.

§ 142. **Franklin Society of Providence, R. I.**—It may interest the Members of the Torrey Club, to know that a Botanical Section of the Providence Franklin Society has been instituted, which meets every alternate Thursday evening. The attendance has so far been quite good, and we perceive encouraging symptoms of increasing membership. In addition to the exhibition of specimens, and the friendly interchange of views, a topic is chosen for discussion, and to this special attention is given. In this way, *Rudimentary Organs*, *Fertilization*, etc., have been considered. It is purposed, too, that a systematic work of collection of Rhode Island plants be entered upon, exchanges established, etc. A feature in our meetings, so far, has been the attendance of a number of ladies, and we can safely affirm an increasing interest in our beloved science in this community. For our little Society we bespeak the kind attention of similar organizations everywhere, and we will be glad to receive any suggestions, and to welcome any visitors. The Officers are: Chairman: W. W. BAILEY; Secretary: L. W. RUSSELL. W. W B.

§ 143. **Habenaria ciliaris**, R. Br.—This occurs here with flowers varying in color from bright yellow to nearly white, and it is noticeable that the deeper the yellow color the more strongly are the lateral sepals reflexed. J. B. E.

NEWFIELD, N. J.

Terms—*One Dollar per annum beginning with the January number. For the Botanical* ***Directory*** 30 ***cents.*** ***Supplement to Directory***, 10 ***cents.*** ***Vols. I.-V., with index, and*** *photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*, 25 *cents* *Address*, WM. H. LEGGETT, 224, *E. Tenth Street, New York. Money Orders on Station D, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

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Vol. VI., No. 26.] Bulletin of the Torrey Botanical Club. [New York, Feb , 1877.

§ 144. South Jersey Fungi, by J. B. Ellis.

(*Continued from Vol. VI., No. 21.*)

35. **Stereum fimbriatum,** *n. sp.*—Parvum, sessile, cupulare, albo-tomentosum; hymenio albo-griseo, adpresse-pubescente; margine albo substriato fimbriatoque.—On decaying oak stumps—Feb.

Small $\frac{1}{8}'$–$\frac{1}{4}'$ across, cup-shaped, sessile, white tomentose; hymenium at first clothed with a fine, grayish-white, appressed pubescence, at length becoming glabrous and of a dull livid color; margin white, striate and fimbriate.

36. **Pistillaria clavulata,** *n. sp.*—Alba, abrupte clavata; stipitibus subcurvatis, tomentoso-pubescentibus, e sclerotio crescentibus; sporis oblongis vel ellipticis; sporophoris bicuspidatis.—On dead stems of Desmodium strictum. Sept.

About $\frac{3}{16}$ of an inch high, white throughout; head short, clavate, soon nodding, not decurrent on the stem, which is about twice as long, minutely tomentose-pubescent, arising from a subcuticular, orbicular, depressed, subrufous sclerotium; spores oblong-elliptic, about .0004′ long, sporophores bicuspidate.

37. **Hysterium Nova-Caesariense,** *n. sp.*—Gregarium, peritheciis laevibus, oblongis, acutis, labiis subapertis; ascis late clavatis; sporidiis oblongo-fusiformibus, multiseptatis, leviter curvatis.—On the outer bark of living Pines (P. inops). Through the year.

Gregarious, lying in all directions; perithecia smooth, tubercular at first, becoming narrowly oblong with the extremities acute; lips distinctly but not widely separated; asci broadly clavate, paraphyses tufted at the summit? Sporidia oblong or subnavicular, multiseptate, nearly hyaline at first, becoming brown, slightly curved .0015′–.002′ × .0004′–.0006′.

Dr. Rehm refers this to *Mytilinidion.*

38. **Dermatea olivacea,** *n. sp.*—Cupulis cespitosis, erumpentibus, stipitatis, planis, olivaceo-pulveraceis; ascis latis, obtusis, breviter stipitatis; sporidiis oblongis, obtusis, biseriatis; paraphysibus linearibus, crispatis, simplicibus vel parce ramosis.—On dead Ilex glabra. Aug., 1875.

Cespitose, erumpent, narrowed below into a short stem covered with a fine olive powder; disk nearly plane with an obtuse margin; asci broad, bag-like, obtuse, narrowed below into a short stem, filled at first with greenish granular matter and large oil globules, and surrounded with a hyaline border .005′–.0055′ × .0008′–001′; Sporidia large, about .0015′ × .0005′–.0006′, oblong, obtuse, biseriate, loosely filled at first with greenish merenchymatous matter, finally becoming darker; paraphyses linear, crisped, simple or sparingly branched above and slightly thickened at their tips. The specc. were young and it is probable that the mature sporidia may differ somewhat from the above characters in size or color, but I see no appearance of any septum.

39. **Peziza** (Mollisia) **conorum,** *n. sp.*—Sessilis, parva, orbicularis, disco convexo, immarginato; ascis cylindraceis; sporidiis oblongis.—On cones of Pinus inops lying on the ground. Malaga, N. J. Nov.

Orbicular, closely sessile, immarginate, convex becoming plane or even concave when dry, surrounded when young by a slightly raised border formed by the epidermis of the scale, color yellow brown; asci cylindric; sporidia oblong .0006′–.0008′ × .0003′–.0004′, in a single or double series, generally single below and crowded above. The fungus might easily be mistaken for a flattened, half dry globule of pitch.

40. **Peziza** (Mollisia) **hypnicola,** *n. sp.*—Cupulis parvis, gregariis, sessilibus, obconicis, pallide aurantiacis, glabris, concavis, margine obtuso; ascis subcylindraceis .004′ longis; paraphysibus apice incrassatis; sporidiis monostichis, hyalinis, anguste oblongis, uniseptatis, .00035′–.0004 × .0001′.—On Hypnum sylvaticum, Bethlehem, Pa., legit Robert Rau.

Gregarious, sessile, small, about .01′ in diameter, obconic or inversely hemispheric, orbicular, flesh-colored when moist, pale orange when dry; margin smooth, obtuse; asci slender, about .004′ long; paraphyses thickened at the tips; sporidia uniseriate, placed end to end or lying obliquely, hyaline, narrowly-oblong, slightly curved, uniseptate .00035′–.0004′ × .0001′. The cups are slightly concave above, smooth throughout, and scattered thickly over the leaves of the moss on which the fungus grows—Substance carnose, rather tough—Related to *P. mycogena*, Ell., but larger and of a deeper color.

41. **Peziza** (Mollisia) **heterocarpa,** *n. sp.*—Cupulis gregariis, stipitatis, parvis, semilineanibus, pallide viridibus; disco submarginato, plano vel plano-convexo; ascis clavatis, cylindraceis; sporidiis biseriatis, fusiformi-ellipticis, hyalinis, binucleatis, .0008′ longis; stylosporis sporidia simulantibus, indistincte septatis, pedicellatis.—On dead stems of Bidens. Nov.–March.

Gregarious, stipitate, small, about ½″ broad and high, pale greenish becoming darker; disk indistinctly margined, plane or plano-convex, becoming concave in drying; stem about half a line high; asci clavate-cylindric; sporidia biseriate, elliptic-fusiform, hyaline, binucleate, about .0008′ long; paraphyses stout, thickened and colored olive green at their tips; stylospores about the same shape and size as the sporidia, faintly biseptate, with or without a hyaline apiculus, borne on threads or pedicels arising from the subhymenial layer with the asci and paraphyses and about ⅔ as long. The stylospores are produced in the same manner as observed in *Tympanis* by Mr. Berkeley and figured by him in his *Introduction to Cryptogamic Botany*. p. 244.

42. **Sphaeria** (Byssisedae) **luteobasis,** *n. sp.*—Peritheciis parvis, nigris, impolitis, subiculo aureo fibroso-contexto insidentibus; ostiolis haud prominentibus, perforatis; ascis clavatis, longe stipitatis; sporidiis biseriatis, cylindraceis, curvatis, hyalinis.—On decaying Oak, lying on the ground. January.

Perithecia small, black, thickly scattered over a loosely compacted, fibrous, light yellow subiculum; ostiola not prominent, with a rather large opening; asci clavate, with a long slender stem about .004′ × .0003′; paraphyses linear, with a row of nuclei, not thickened above; sporidia, as in some species of *Valsa*, biseriate or crowded above, cylindric, hyaline, curved, .0005′ long.

The yellow subiculum is more noticeable when sterile, extending for an inch or more in length and breadth and penetrating, and staining with its yellow mycelium the decaying wood beneath, at length disappearing in the spaces between the perithecia. Not to be confounded with *Sphaeria subiculata*, Schw., which is quite a different thing.

43. **Sphaeria** (Denudatae) **longispora,** *n. sp.*—Sparsa, ovato-conica, ostiolis minutis, leviter prominentibus, ascis cylindraceis, .005′–006′ × .0004′–.0005′; sporidiis subhyalinis, linearibus, ascos subaeqantibus, utrinque acuminatis.—On decaying wood of Kalmia latifolia lying on the ground. July, 1874.

Perithecia small, dull, black, not polished, ovate or ovate-conic; ostiolum slightly prominent, minute; asci cylindric; sporidia nearly colorless, linear, nearly as long as the asci, narrowed to a slender point at each end, with a row of nuclei.

44. **Sphaeria** (Denudatae) **vetusta,** *n. sp.*—Gregaria, superficialis, cylindrico-conica; ostiolis papillaeformibus; ascis late cylindraceis, basi abrupte contractis; sporidiis monostichis, ellipticis, primo uniseptatis, mox fenestratis.—On a dead place in the trunk of a Maple tree where the bark had been rubbed off. Nov. 1874.

Gregarious, superficial, of medium size; perethecia thin, elongated conic, not polished, dull black, ostiolum depressed hemispheric, black and shining, with a large opening; asci broad, cylindric, obtuse, abruptly narrowed at base, .005′ × .001′; sporidia uniseriate, obtusely and broadly elliptical, nearly colorless, uniseptate and more or less constricted at the septum when young, at length brown and fenestrate, .0009′–.001′ × .0005′. The mature sporidia are not constricted.

45. **Sphaeria inflata,** *n. sp.*—Sparsa, parva, adnata, nigra, impolita, subhemispherica demum superne collapsa; ostiolo haud prominente, irregulariter pertuso; ascis late cylindraceis, .004′ × .001′, subsessilibus, sporidia octo oblongo-elliptica foventibus.—On the dry exposed surface of Red Oak railroad ties. Jan.

Scattered or subgregarious, closely adnate, black, rough subhemispheric or depressed conic; ostiola not prominent, with a rather large opening; asci broad cylindric, subsessile; sporidia oblong-elliptic, crowded, dotted with transparent nuclei; hyaline, triseptate and constricted at the septa, which are more readily seen when treated with tincture of Iodine.—The surface of the perithecia and the wood adjacent is generally overspread with loose, creeping, sparingly septate threads, sending up here and there erect, closely septate branches.

Sphaeronema nigripes, Vol. VI., No. 21, is probably not distinct from *S. acerrimum*, Pk. All the foregoing, except No. 40, were collected in the vicinity of Newfield, New Jersey.

§ 145. **A new Fungus from Pennsylvania.—Pestalozzia Stevensonii,** Peck.—Pustules small, hysteriiform or pezizoid, erumpent, closely surrounded by the ruptured epidermis, black; spores fusiform, triseptate, .0007–.0008 inch long, (colored part .0005–.0006) the terminal cells hyaline, the two central ones colored, terminal bristles three or four, widely divergent; sporophores about equal in length to the spores, easily separating.

Scales of fir cones, *Abies excelsa*, Westchester, Pa. *W. C. Stevenson, Jr.*

The species differs from *P. Guepini* in habit and in the fewer septa of the spores. This latter feature and the rather long bristles will also separate it from *P. funerea*. I have dedicated the species to its discoverer. CHARLES H. PECK.

ALBANY.

§ 146. **Variations in Lomaria and Polypodium.**—Mr. Joseph Howell has sent to me from Oregon some speciments of *Lomaria spicant*, Desv., in which the pinnæ are very strongly serrate—almost incised. These specimens are so strikingly distinct in appearance from the normal form, in which the pinnæ are entire, as almost to justify naming them *var. serratum ?*

Mr. Howell has found this form now for two seasons in succession, but as he writes that the plants last season were not nearly as strongly marked as they were the previous year, and as it is not unlikely, therefore, that they may again revert to the normal form, it may be best to await further developments before recognizing a variety. In any case, however, this interesting variation seems worthy of being placed on record.

Mr. Howell has also sent to me a specimen of Polypodium that shows how cautious we should be in admitting varieties, especially when based on the evidence of detached fronds.

In this case there are two fronds attached to the same rhizoma, and one of these fronds has entire pinnæ, while in the other the pinnæ are coarsely and deeply serrate. This latter variation is not uncommon, even to deep incisions, in the Pacific Polypodiums, those of the southern coast of California being especially prolific in such forms.

Would it not be better in all such cases, when known, to have the specific descriptions include these variations, rather than to recognize them as distinct varieties ? GEO. E. DAVENPORT.

BOSTON, *February* 16, 1877.

§ 147. **On the means of protection in flowers against unwelcome visitors.**—In *Nature*, Jan. 11, Vol. XV., p. 237, is an exceedingly interesting account of a monograph by M. Kerner, of the Zoological-Botanical Society in Vienna, on this subject. "We have space but to indicate the tenor of this paper, and to recommend it to the notice of those who seek in "morphological characters a biological significance." M. Kerner gives an account of the manifold forms which are of use to guard flowers against uninvited guests, wingless insects, for example, who would be of little service in conveying the pollen from one plant to another. One means of protection consists in isolation by water ; sometimes collected in the axils of the leaves (from which circumstance perhaps Aquilegia gets its name) ; sometimes surrounding this plant, as in Polygonum amphibium. "When, however, the water has run off, and the plant is on dry ground, there develop on the leaves and stalks gland-hairs, which secrete a sticky matter, rendering the flower-bearing axis all smeary, so that access is equally forbidden to the creeping insects. If, now, a plant of Polygonum, bearing these gland hairs, be put in the water again, the trichome-tufts, with their sticky material, disappear, and the surface appears once more smooth and even." Compare Gray's Manual on the varieties, and Hall, in BULLETIN, Vol. III., p. 1.

§ 148. Fresh Water Algae. II.

In putting forth this addition of one hundred species to the Fresh Water Algae of our country it is proper to preface it by a few brief remarks.

In general I have followed the nomenclature of Dr. L. Rabenhorst and others of the German schools, but, in a few instances, have deviated to the more modern arrangement suggested by the late Dr. M. G. Thuret, of France, as given to the public by his co-worker and successor, Dr. E. Bornet, of Paris. Unfortunately the new classification covers only one division, the "Nostochinées."

Thuret set out with the idea that many genera have been created upon insufficiently defined characters, and that many species have been described from the same plant found by different authors in various localities in different stages of development. There is no doubt that many spurious forms are found on record as distinct plants. As an illustration I quote only one example. I found "Gloeotrichia" in abundance in a pool near Buffalo, N. Y. The thalli varied in size from that of a mustard seed to that of a hen's egg. Trying to identify it, I found forms to correspond to no less than eight described species, yet evidently all one plant. Thuret suggests Gloeotrichia *natans*, to take in nine forms. My study of this subject has been brief, only three years, yet the wisdom of Thuret's suggestion is evident.

Dr. H. C. Wood, Jr., of Philadelphia, made the Fresh Water Algae a study for a couple of years, but abandoned it quite too soon. The result of his labors is a valuable work published by the Smithsonian Institute, in many respects an excellent guide, and especially convenient as a compilation of all plants heretofore found in this country. It is a great pity that he did not pursue his studies a longer time. Errors that crept into his work could have been most easily and satisfactorily corrected by himself.

In the subjoined list only such species are named as are believed to be entirely new discoveries for the United States. All plants heretofore positively quoted by Bailey, Olney, Wood and others, are omitted. Those not having the locality noted have been found within a circuit of about twenty miles around Bethlehem, Pa. Where the special habitat is omitted, it is supposed to be the same as that given by the author of the species. FRANCIS WOLLE.

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1. **Chroococcus,** Naeg. Ch. rufescens, Naeg., Niagara, N. Y.—Ch. turgidus, Naeg.

2. **Gloeocapsa,** Ktz.—Gl. Itzigsohnii, Bornet. Shaded rocks.—Gl. janthina, Naeg. Cliffs, Niagara.—Gl. aeruginosa, Ktz. Niagara.—Gl. ochracea, Ktz.—Gl. gelatinosa, Ktz.—Gl. mellea, Ktz. Colorado. Gl. haematodes, Ktz. Swampy ground.

3. **Aphanocapsa,** Naeg.—A. rivularis, Rabenh. In ponds, attached to wood or stone.

4. **Anacystis.**—A. marginata, Menegh. Pools.

5. **Polycystis,** Ktz. P. piscinalis, Brüg. Pools.

1 - [illegible] [illegible] [illegible] as this Dr. M. G. p. 203.

6. **Gloeothece,** Naeg.—*Gl. magna, n. sp.* Thallus large, thin, irregularly oblong, pale yellowish green. Cellules nearly twice as long as wide, many in a family; teguments usually colorless at the margins, cytioplasm homogeneous. Cellul. .00012″–.00016″ wide. Teg. .002″–.006″ long. about one-third as wide. Forms a coating on small water plants, or floats in ponds, many families joined together.

7. **Vibrio,** Müller.—V. Rugulo, Mül.—V. lineola, Mül. On Nuphar advena, in ponds.

8. **Oscillaria,** Bosc.—O. tenerrima, Ktz.—O. major, Vauch.—O. Bonnemaisonii, Crouan.—O. brevis, Ktz.—O. gracillima, Ktz.

9. **Phormidium,** Ktz.—Ph. congestum, Rabenh.—Ph. vulgare, Ktz. Both on damp earth.

10. **Microcoleus,** Desmaz.—M. terrestris, Desmaz. (*Chthonoblastus Vaucheria*, Ktz.)

11. **Hydrocoleum,** Ktz.—H. versicolor, Rabenh. Wet rocks.

12. **Symploca,** Ktz.—S. lucifuga, Breb. Shaded clay banks.

13. **Gloeotrichia,** J. Ag.—Gl. natans, Thuret. Fronds, attached to water plants in pools, Buffalo, N. Y.—Gl. pisum, Thuret. On leaves of a small form of Potamogeton in ponds.

Dr. Wood evidently found forms of this genus; the one in a decayed condition, and the other in an immature state. The one he named, *Gl. incrustata*, and the other, *Dasyactis mollis*.

14. **Zonotríchia,** J. Ag.,(*Rivularia*, Thuret).—*Z. paradoxa*, n. sp. —Thallus hemispherical, gelatinous, bright aeruginous green; trichoma green, or tinged with brown, granular, apex colorless, continuous or indistinctly divided; articles subequal -to three times as long as wide, very variable; younger filaments flagelliform, older ones often contracted in the middle, or narrow below and gradually widened more than half the length, then tapering to a fine point. Filaments of the latter form are usually much longer, double the length of the former. Diameter of wider parts, .00025″–.0003″. Heterocyst, .0004″–.0005″.—Z. chrysocoma, Rabenh. Moist rocks, Niagara. Wood's *Z. parcezonata* is probably the young growth of the latter.

15. **Mastigonema,** Schwabe., (*Calothrix*, Ag.)—M. caespitosum, Ktz. Common on submerged stones.—M. Orsinianum, Ktz. On rocks in rapids of Niagara river.—M. plana, Rabenh. Wet rocks, Portage, N. Y.

M. violacea, n. sp. Caespitose, parasitic, aeruginous, trichoma simple, occasionally interrupted, usually ending in an extended, colorless point. Divisions often indistinct, short, one-forth to one-half as long as wide below, and longer towards the ends, finally four to six times as long as wide. Sheath ample, often truncate, almost colorless. Heterocysts more or less compressed. Filaments usually in clusters, ten to twelve arising from the same thallus, a sort of warty excrescence. Color of the young plants aeruginous; as they mature they change to a purplish iron or amethyst color. Old plants are olivaceous-brown. Trichoma .0003″–.00038″. Sheath .00067″–.00075″. Parasitic on Plectonema in shallow river waters. Near *Lyngbya confervicola*, Dillw., but beside not being marine, it varies in size, and has the divisions twice as large.

M. fusca, n. sp. Parasitic on Cladophora, etc. Trichoma simple, long, olivaceous, brownish-yellow, or dull aeruginous. Mature plant not articulate, or very indistinctly so, except the rather long, thin, colorless ends, in which the divisions are two to four times as long as wide. Filament linear, granular. Sheath rarely seen. Heterocysts spherical, rather smaller than the adjoining cells. Plants vary greatly in length, from 10 to 100 and more diameters. The young plants are distinctly articulate, usually one large cell next the heterocysts; other divisions about as long as wide; filaments at first in a horizontal position, one on the other; as they mature they become erect and tortuous, caespitosely attached. Filaments .0003″ to .0004″ in diameter.

M. lutea, n. sp. Strata thin ochreous, filament aggregated, suberect or flexuonsly curved, simple. Trichoma bright brownish-orange, distinctly articulate, articles half as long as wide, and usually separated by a distinct space. Sheath ample, often twice as wide as the trichoma, and tinged with the same color, or colorless, firm, slightly attenuated, generally open at the apex, and extending beyond the trichoma. Heterocysts oblong-globular. Sheath .00084″ below, tapering to .0005″. Partly exposed stones in spring water.

16. **Diplocolon.**—D. Heppii, Naeg., Niagara.

17. **Scytonema,** Ag.—Sc. tolypotrichoides, Ktz. In gelatinous masses on dripping rocks.—Sc. Hegetschweileri, Itz. Forms a dark brown coating on wet rocks, Niagara; differs very slightly from the European form. Probably the same plant Dr. Wood described under the name, *Sc. cataracta.* See Rabenhorst's Algen Europa's, No. 2492.—Sc. Chrysochlorum, Ktz., Niagara, shaded rocks.—Sc. natans, Breb. In pools.

18. **Symphyosiphon,** Ktz.—S. incrustans, Ktz.—S. Contarenii, Ktz. Both common on rocks exposed to the spray of Niagara Falls.

S. Wollei, Bornet, *n. sp.* Forms a more or less expanded stratum, one line high, on calcareous rocks. Olive black, ascending, curved, sparsely branched, single or geminate patent. Trichoma continuous, or indistinctly articulate; articles equal to or less than diameter, rarely submoniliform, towards the ends two or three divisions to diameter, often distinct, dull aeruginous or olive-yellow, granular, not enlarged at the ends. Sheath firm, smooth and usually very close. Ends rounded but often open and colorless. Heterocysts subglobose or nearly square. Vag. .0006″-.00081″.

19. **Tolypothrix,** Ktz.—T. muscicola, Ktz. Pond mosses.—T. truncicola, Thuret, moist wood.

20. **Plectonema,** Thuret.—Pl. mirabile, Thuret. On wood and moss in lime stone springs.—Pl. Wollei, Farlow. For description, see Bulletin of Bussey Institution, Vol. II., part 1., p. 75. Attached to stones and sticks in slow waters.

21. **Fischera,** Schwabe.—F. thermalis, Schwabe. Differs from the European form in having the trichoma more than one-third thicker. In small pools in swampy ground.

22. **Pleurococcas,** Menegh.—Pl. minuatus, Ktz.—Pl. vulgaris, Menegh.

23. **Gloeocystis,** Naeg.—Gl. rupestris, Lyngh. Calcareous rocks in a cave.

24. **Urococcus,** Hassel.—U. Hookerianus, Berk. Dripping rocks.

25. **Tetraspora,** Link.—T. gelatinosa, Desv. Attached to logs and stones in ponds.

26. **Hormospora,** Breb.—*H. geminella*, n. sp. Filaments simple, tubular, aggregated or single; sheath firm, colorless; cells bright green, granular, oval, or cylindrical with ends rounded, more or less in pairs, rather closely connected, but more widely separated as the plant matures. Diam. of cells .00064″; filaments .00083″. In pools of exposed water. Frequent here, also at Buffalo, N. Y., and in Colorado.—See Rabenhorst's Algen Europa's, Dec. 240, No. 2494.

H. pygmaea, n. sp. Filaments single, gelatinous, even, or, by longitudinal division of cells, often undulate. Articles subequal with diameter, colorless, each contains two green cells, half as long as wide, transversely arranged. The general appearance very near Rabenh's figure of H. transversalis, Breb., but very diminutive compared with it. Diam. of fil. .0005″. In pools.

27. **Hydrurus,** Ag.—H. olivaceus, Naeg. Logs and stones in rapid, shallow waters.

28. **Protococcus,** Ag.—Pr. viridis, Ag.—Pr. fuligineus, Lenorm.

29. **Chlorococcum,** Fries.—Ch. humilicola, Naeg. Sides of shaded wooden vessels of water.—Ch. gigas, Grun.—Ch. infusorum, Menegh. Both in pools.

30. **Polyedron,** Naeg.—P. trigonum, Naeg.—P. tetraedricum, Naeg.

P. *aculeatum*, n. sp. Triangular sides concave ; one surface conically elevated, and ending, like the three angles, with a rather long sharp aculeus.

31. **Ophiocytium,** Naeg.—O. majus, Naeg.—O. (*Sciadium*) arbuscula, A. Braun. Marsh pools, etc.

32. **Coelastrum,** Naeg.—C. Naegelii, Rabenh.

33. **Staurogenia,** Ktz.—*St. crucifera*, n. sp. Cells rhomboid. Sides slightly concave, angles rounded; surface with two lines crossing each other at right angles at the centre. Usually four cells in a family. Diam. of fam. .00084″–.001″. On boarded sides of basins.

34. **Chlamydococcus,** A. Braun.—Chl. pluvialis, A. Braun.

35. **Chlamydomonas,** Ehrb.—Chl. obtusa, A. Braun.

36. **Pleurocarpus,** A. Braun.—Pl. mirabilis, A. Braun. Pools and shallow waters.

37. **Hydrogastrum,** Desv.—H. granulatum, Desv. Exposed soil, Buffalo, N. Y. Dr. Wood, also, found imperfect specimens of this plant.—H. Wallrothii, Ktz. Damp earth, Buffalo, N. Y.

38. **Vaucheria,** DC.—V. tuberosa, A. Braun, rather a doubtful species; shaded clay soil.—V. reptans, Hass. Shaded garden soil.—V. velutina, Ag. On earth saturated with warm water.

39. **Microspora,** Thuret.—M. laevis, Rabenh. From dripping rocks.

40. **Conferva,** Link. C. bombycina, Ag. Fresh spring water.—C. fontinalis, Berk., attached to wood in sides of reservoir of running water.

C. *Farlowii, n. sp.* Filament long, 2–8 or more inches, yellowish green in early spring, in maturer state usually of brownish or ochreous color, attached to stones or earth in small streamlets of fresh water. Divisions 2–3½ diameters, granular, and often tumid. When dried, dull greenish or ochreous. Diam. .00025″–.00038″.

C. *glacialioides*, n. sp. Near Ktz's C. glacialis. Light green. Length of divisions, 2–5 diameters ; not contracted at the joints. Divisions not swollen. Dries light pea-green. Diameter .00024″–.00032″. In gelatinous masses on dripping rocks.

41. **Psichohormium,** Ktz.—P. major, Ktz. Stagnant pools and quiet waters.

42. **Cladophora,** Ktz.—C. fracta, Dillw., frequent in pools.—C. viadrina, Ktz. Not uncommon on moist earth.—C. canalicularis, Roth. Niagara, Three Sister Islands.

43. **Chloropteres,** Mont.—Ch. Leprieurii, Mont. Found sparsely intermingled with a Conferva collected by Mr. Brandegee, Col. Observation of more ample specimens may change the specific name.

44. **Rhizoclonium,** Ktz.—Rh. hieroglyphicum, Ktz., *Var. Americanum*, new var. The size is larger, and the divisions are shorter than those of the European forms. Shaded garden ground and green-houses. Represented in Rabenhorst's Algen Europa's, Dec., 240, No. 2496.

45. **Oedogonium,** Link.—O. subsetaceum, Ktz.—O. compressum, Hassel. Differs from the typical form in basal cells ; these are disciform, and not trilobate. On Spatter-Dock in pools.—O. capillaceum, Ktz.—O. fonticola, A. Braun. Ponds of spring water.

46. **Ulothrix,** Ktz.—U. varia, Ktz. Exposed clay soil.—U. tenuis, Ktz. On stones in rapid waters.—U. subtilis, Ktz. Not unfrequent in troughs of running water.—U. nitens, Menegh, forms a dark green coating on moist shaded stones and brick pavements.—U. flaccida, Ktz., frequent in green-houses, etc.

47. **Chroolepus,** Ag.—C. lageniferum, Hild.—C. umbrinum, Ktz. This is the same plant, figured by Wood as *Pleurococcus seriatus*. Bark of trees.

48. **Bulbotrichia,** Ktz.—B. *Onokoensis*, n. sp., found in small bright pea-green cushion forms, ⅛ in. to 1 inch in diameter, on partly shaded rocks in Onoko Glen. Represented in Rabenhorst's Algen Europa's. Decade 243, No. 2428.

49. **Schizogonium.**—Sch. Boryanum, Ktz. Rocks, Colorado. Collected by Mr. Brandegee.

Sch. Ravenelii, n. sp. Forms a thin olive green coating on bark of trees. Filaments flexuously interwoven, sometimes free, but more usually laterally united, commonly two, but frequently 3 or 4. Articles equal to half the diameter. Cytioderm thin, colorless. Diam. of fils., .00064″–.0007″. Collected by Prof. Ravenel, Aiken, S. C., from the bark of Melia Azederach, or China-Tree.

50. **Chaetophora,** Shrank.—Ch. radians, Ktz. Hab. on plants in pools.

51. **Stigeoclonium,** Ktz.—S. tenue, Ag.—S. thermale, A. Braun. Dr. Wood ventures no species. The former is probably the plant he observed.

52. **Aphanochaeta,** Brown. I find three varieties. Besides the name adopted by Dr. Wood, I add "A. confervicola," Naeg. Found parasitic upon other Algae.

§ 149. **New Mosses,** by C. F. Austin.

1. **Pleuridium Ravenelii.**—Paroicum, cæspitosum, aureo-viride, sericeo-nitens; caule erecto 1–2 lineas longo stricto simplici et subdiviso parce breviterque stolonifero, foliis erectis strictiusculis inferioribus ovatis et ovato-lanceolatis (infimis in caule longiori squamiformibus appressis) concavis apice complicato-carinatis, superioribus seu perichætialibus multum majoribus congestis a basi laxa lanceolata vel oblonga vel sæpe obovato-oblonga superne carinata magis minusve raptim in subulam nunc breviusculam nunc longam angustissianam solidam complicato-canaliculatam sublævem subintegerrimam productis, costa lata totam subulam occupante; capsula stramineo-fusca magna toto immersa vel lateraliter emergente rotundo-ovali (raro subovata vel oblonga) apiculo parvo instructa, calyptra minuta obliquata cucullata, sporis pro genere magnis (an maximis?) circiter $\frac{1}{750}$ unc. metientibus luteis papillulosis.—*Pl. subulatum*, Sulliv. *Mosses, etc.*—Light sandy soil, S. Car. *Ravenel;* New Jersey, *James*, *Austin;* Rhode Island, *Bennett;* Massachusetts, *Jesup.*

Color of the foliage, a changeable yellowish-green. Varies in damp situations, with the stems a little longer, leaves longer and less abruptly narrowed above. The European *Pl. subulatum*, with which this species has hitherto been confounded, has stems a little longer, leaves gradually tapering from a much narrower base into a usually longer, somewhat flexuous, less opake, simply concave (not complicate), more or less distinctly serrate point, which is papillose-serrate on the back, the lower-most ones never ovate nor appressed, the inner ones of the pericheth much narrowed; capsule ovate, with a larger apiculus; spores much smaller (about $\frac{1}{1100}$–$\frac{1}{1200}$ of an inch in diameter).—Nearest to *Pl. nervosum*, Hook., as figured and described in *Musc. Exot. t.* 105, but that is described as having the capsule acuminulate and rufo-fuscous, the leaves appear to be less abruptly subulate-acuminate and not canaliculate above (a striking character of moss); besides the inflorescence is supposed to be autoicous.

2. **Pleuridium stramineum** (Lesqx. olim).—(*Pl. subulatum*, Lesqx., in *Pacific Coast Mosses*, p. 5.)—Inter *Pl. subulatum* et *Pl. Ravenelii* subintermedium, a priori differt caule stolonifero, foliis basi latioribus magis convolutis apice vix serratis dorso lævibus, perichætialibus intimis haud angustioribus, magis subito angustatis, pedicello sæpe longiore, sporis paulo majoribus (circiter $\frac{1}{1000}$ unc. metientibus); a posteriore paulo rubustior, magis stolonifer, foliis longioribus minus abrupte angustatis haud carinatis, sporis minoribus, etc.

3. **Pleuridium Sullivanti.** (*Pl. nervosum*, Drumm., 2 Coll., n. 6; Sulliv. *Mosses*, etc., haud Hook.)—Stems gregarious, clavate, slender 2–4 lines long, subarcuate, rigid, innovately branched. Innovations filiform, about equalling the stems. Leaves closely imbricated in a julaceous manner, appressed; the lower-most ones and those of the innovations ovate, submucronate, closely and finely serrate-dentate; areolation above close, narrowly and irregularly rhomboidal, below lax, and somewhat quadrate; costa stout, percurrent; upwardly (on the main stems) they are gradually somewhat

enlarged and longer pointed, less regularly and less distinctly serrate; the upper or perichætial ones are suddenly much enlarged, mostly obovate-oblong or subspatulate, very abruptly cuspidate, erose serrate above; costa percurrent or shortly excurrent; areolation at the base mostly rather long, narrow and straight, or of the innermost ones more lax and subhyaline. Capsule large, when dry round-ovate and very obtuse, with a papulate apiculus, dark brown, shining, of a solid texture, when moist slightly acuminate, immersed on a very short pedicel. Calyptra large, broad, dimidiate-campanulate, entire at the base (but slightly fissured under pressure), split on one side to the base of the slender persistent style, scarcely acuminate. Spores yellow, papillose, about $\frac{1}{1000}$ of an inch in diameter. Antheridia about 3, usually naked, and always completely hidden in the axils of one or two of the lower leaves, but sometimes furnished with a single narrow ecostate perigonial leaf, or, according to SULLIVANT, with 3–5 of these leaves, also with two or three small paraphyses.—Light sandy soil, S. Car., *Ravenel*, 1876.

Readily distinguished from *Pl. Ravenelii*, by its more clavate stems, shorter, and more densely imbricated, not carinate leaves, darker colored, and more solid capsule on a shorter pedicel, larger calyptra, and by the antherdia situated much lower down on the stem (not in the axils of the comal leaves). The true *Pl. nervosum*, as partially figured and described in HOOKER'S *Musc. Exot. t.* 105, is certainly different, being nearest to *Pl. Ravenelii*, and possibly identical with it. *Pl. Robbinsoni*, Mont., to which Mitten has referred our Moss, has autoicous inflorscence, the male flower being of moderate size, and rather conspicuous; the upper leaves are narrower and less abruptly acuminate with longer points, the lower ones are rather more acute, etc. (I have not seen the spores nor the calyptra.)

4. **Bruchia Sullivanti.** [*Bruchia flexuosa*, SULLIV. Icones (excl. descript.) *t.* 13; AUST. *Musc. Appalach.* n. 56; haud SCHWÆGR.]—Statura facieque *Br. flexuosæ*, sed inflorescentia paroica foliis subpapillosis, etc., statim dignoscitur.

Capsule concolorous, the collum much constricted in drying, pale yellow, becoming fuscous. Spores minute (about $\frac{1}{750}$ - $\frac{1}{900}$ of an inch in diameter), yellow, opake, papillose. Leaves mostly longer than the pedicel (often over-topping the capsule), more or less papillose above (often very obscurely so), nearly or quite entire.—Occurs on damp ground, from New England to Florida and Louisiana.

Bruchia nigricans (S. & L.)—*Br. flexuosa* var. *nigricans* S. & L. *Exsic. Ed.* 2. n. 42. A præcedente proxima distincta sporis fere duplo majoribus, pedicello longiore strictiore. etc. Differt a sequente foliis lævibus collo breviore, etc.—Capsule concolorous? Spores yellow, as in all the species! in size and texture about as in *Br. brevipes*, *Hallii*, *Texana* and *Dounellii*. Leaves nearly or quite as long as in the preceding species. The true *Bruchia flexuosa*, SCHWÆGR., with autoicous inflorescence, and with spores about as in *Br. Sullivanti*, is given in S. & L. *Exsic. ed.* 2, *n.* 41. The specimens were probably collected in Ohio. I have not seen it from any other source.

n 5. **Bruchia Dounellii,** *n. sp.*—Paroica; statura *Br. flexuosæ*, pedicello strictiori, foliis a basi subrotunda subitius subulata distincte papillosa, capsula bicolore? collo longiori crassiore, sporis
n fere duplo majoribus.—Florida, *J. Dounell Smith.*

Inflorescence, long thick collum of the capsule, and (large) spores, as in *Br. Texana*, AUST.; but that has much shorter, smooth leaves.—*Br. Hallii*, AUST., is also parœcious, and has large spores; but the collum of the capsule is much shorter, as well as are the smooth leaves.

6. **Bruchia Caroliniæ,** *n. sp.*—Inter *Br. Ravenelii*, WILS., et *Br. brevipedem*, HOOK., medium tenens, differt a priori calyptra minus papillosa haud turbinata, capsula collo longiori; a posteriori calyptra papillosa capsula minus distincte bicolore; ab utroque foliis brevioribus, pedicello basi valde arcuato, sporis minimis fere lævissimis nitidissimis pellucidis, florescentia prom ore synoica.—South Carolina *Ravenel*, associated with *Br. Ravenelii* and *Br. brevipes.*

Stems very short, gregarious. Leaves nearly smooth, subserrate at the apex. Capsule usually equalling or exceeding the leaves, on a pedicel of nearly its own length, more or less bicolorous, the apex light reddish brown, shining; the collum nearly as long as in *Br. brevipes.* Calyptra globose-ovate, acuminulate, papillose. Spores less than $\frac{1}{1000}$ of an inch in diameter, minutely punctulate, remarkably brilliant and pellucid. Inflorescence synœcious (or occasionally autoicous), the antheridia all on one side, at the base of the vaginula. —*Br. Ravenelii* has a shorter, less arcuate pedicel, capsule paler and with a very short collum, calyptra shorter and broader (turbinal), and more strongly papillose, spores about $\frac{1}{900}$ of an inch in diameter (not $\frac{1}{450}$, as stated in SULLIV. *Icones*), papillose and opake. Leaves much exceeding the capsule, more or less papillose and serrate. Inflorescence always autoicous (male flower very distinct, on the base of the stem).—*Br. brevipes* has longer, smooth and entire leaves; a strongly bicolorous capsule (the upper portion being of a fine red color), on a nearly straight pedicel; calyptra smooth; spores large (about $\frac{1}{500}$ of an inch in diameter), papillose and opake; inflorescence usually parœcious, with the antheridia in the axil of a single (usually lower) comal leaf, but occasionally with the male flower, as in *Br. Ravenelii* (=*Br. Trobasiana*, DE NOT.?).—*Br. brevifolia*, SULLIV., has inflorescence much as in *Br. brevipes* (usually paroecious ~~synœcious~~), but the male flower, when distinct, larger, and terminating a short distinct branch; capsule bicolorous, but the upper part less deeply colored; spores as in *Br. Carolinæ.*

7. **Archidium Lescurii** (*Archidium phascoides*, DRUMM. *Coll.* 2, *n.* 12).—*A. alternifolio* peraffinis, differt tamen statura majore, colore fulvo-viridi, foliis carinatis angustius areolatis, costa validiore solidiore magis tereti sæpe longe excurrente, margine subuniformiter remote serrulata; calyptra generis (vid. TORREY BULLETIN for March, 1874).—With *Bruchia nigricans*, Raccoon Mountains, Alabama, *Lesqx.*; also Florida, Feb., 1877, *J. Dounell Smith.*

NO. 13, of DRUMM., 2d Coll., is *A. Ohioense*, SCHIMP.! This species is readily distinguished from all its congeners by its gemmiform male flower.

8. **Archidium Hallii,** *n. sp.*—A congeneribus flore masc. in caule (vel ramulo?) proprio terminali distinguitur.—Texas, *Hall.*—Leaves with the areolation very lax (much as in A. tenerrimum, Mitt.), the margins often obscurely recurved, the base (as in all the species) more or less echlorophyllose, the costa often long excurrent; calyptra of the genus.

9. **Archidium Ravenelii,** *n. sp.*—Paroicum; caule brevi inferne arena abruto magis minusve diviso, foliis inferioribus dissitis ovatis minutis appressis vel (et illis in innovationibus sterilibus) majoribus apertis breviter laxissime areolatis, superioribus raptim in rosulam vel gemmulam congestis multum majoribus arctissime imbricatis late ovatis vel ovato-lanceolatis magis minusve acuminatis acutis vel sæpe obtusis integerrimis concavis margine versus basin spatio lato hyalinis, costa sub apice evanida vel breviter excurrente, reti laxissimo rotundo-ovali vel rhombeo versus basin longiori et paulum latiori; capsula calyptraque generis.—South Carolina, *Ravenel;* Florida, *J. Dounell Smith.*—Nearest to *A. tenerrimum;* but, judging from a few stems taken from Drummond's Southern Mosses, No. 11, and kindly sent to me by Mr. James, that has the longer sterile stems clothed with much narrower, erect, very acute leaves with a rather close areolation; while the comal leaves of the fertile plant have a narrower areolation and a longer, more excurrent costa.

10. **Sphagnum serratum,** *n. sp.*—Habitu foliorum forma et textura ab *Sph. cuspidato* haud notabiliter dissimile, distinctissimum tamen caule strato corticali triplici et ultra e cellulis majusculis formato et ab ligneo vix distincto, ramulis magis tereti foliosis, foliis caulinis majoribus, ramulinis sæpe latissime marginatis etiam tota longitudine (vel sæpe solum parte superiore) distinctissime remote serratis siccitate margine minus distincte undulatis.—St. Augustine, Florida, *J. Dounell Smith.*

The lower branch leaves are sometimes entire on the margin, while the upper ones are always serrate above the middle. Those of the comal branches are often, if not always, serrate to the base. Some of the leaves are broadly margined, while others on the same branch are either scarcely at all or interruptedly so. The apical leaves are remarkably long and narrow (almost linear), and more or less spirally contorted above the middle. Pores very small and indistinct or none.

§ 150. **Pinus Mitis.**—The attention of Botanists living in the Middle States is directed to this tree, which has become rare in the North. As one of the most valuable of North American timber trees, attention has been drawn to this species as suitable for forest culture, in many parts of the United States, and it is desirable to procure seed for this purpose from as far north as possible.

According to the younger Michaux *Pinus Mitis* was found, in his time, in New York, Connecticut and Western Massachusetts, and Mr. Lapham includes it in his catalogue of Wisconsin plants, but there is no evidence that this tree grows so far north at the present time.

Botanists finding *P. Mitis* in the States above mentioned, or in New Jersey, Pennsylvania, Ohio, or Michigan, are requested to communicate with the Director of the Botanic Garden of Harvard University, Cambridge, Mass.

§ 151. **Wood's Plant Press.**—[On the suggestion of a very distinguished European botanist, we republish the following article.]

The method of drying botanical specimens heretofore generally practised, a method more particularly described in the November and December BULLETINS [1872], is tedious and burdensome. Few, we think, will deny this. The collector who attempts to keep up with the season of flowers must have in use an immense quantity of paper—must rearrange specimens and paper at least twice a day—must thoroughly dry the sheets, separately, daily—all this, besides the collecting, makes botany a *business* rather than a recreation, and leaves too little time for study or any other duty.

It is the drying-press which is in fault—that old-fashioned press used by botanists from Linnæus down. True, it has done good service, and so has the sewing-needle. Shall the sewing-*machine* be rejected on this account? If the intolerable drudgery of plant-drying by *absorption* can be obviated by an invention, why not try it? Wood's *wire-press*, described in the "*Botanist and Florist*," p. 10, and "*Class-Book*," p. 15, is such an invention, unpatented, free to all collectors. It dries by *evaporation* rather than absorption, and thus makes available all the sources of heat, whether natural or artificial. It requires comparatively but little paper—less than half the amount needed in the old process; hence it is portable, and serves the double purpose of portfolio and press. It requires no changing of specimens and papers, no drying of damp and mildewed sheets.

In fair weather the wire press dries in the wind and sunshine; in foul weather, by the fire. In either case, after one or two days the specimens will be found thoroughly cured, and as bright in colors as is possible by any other known method.

To the travelling collector this form of press is invaluable. With it so light is his his labor in drying his specimens that it occasions him little if any delay, and so light his luggage that a single donkey will suffice him in lieu of half a dozen for its transportation. With this simple press the writer, during a single year, cured more than three thousand specimens, in a protracted journey of about fifteen hundred miles. A. W.

[For the convenience of those who may not have the original at hand we copy the description referred to.]

"The drying press, to be most efficient and convenient, should consist of a dozen quires of unsized paper, at least 11 x 14 inches folio; two sheets of wire gauze (same size) as covers, stiffened by folded edges [a narrow, folded edge of tin plate is better]; and three or four leather straps a yard in length, with buckles. When in use, suspend this press in the wind and sunshine; or, in rainy weather, by the fire."

§ 152. **Leaf Calendar.**—Spring has come. It is time to watch the opening buds. We hope correspondents will keep a note book with them, and give us notice of the leaves as they appear, together with the stage of advancement of adjacent trees or shrubs.

§ 153. **Publications.**—1. *American Journal of Science and Arts.* The important paper by Dr. J. H. Gilbert, F.R.S., etc., on the "Sources of the nitrogen of vegetation in general, and of agricultural production in particular," begun in the January No., and continued in that of February, is completed in the March No. In the February No. is a notice by Dr. Gray, of Darwin's new work, on the "Effects of Cross and Self Fertilization in the Vegetable Kingdom," and Prof. Farlow has some interesting notices of European Cryptogamic publications in this and the April No. In the March No., Dr. Gray favors the use of the terms *dextrorse* and *sinistrorse*, as viewed from without; as a common screw, in which the spiral rises towards the right, is recognized as a right-handed screw. Grandeau and Bouton find that the stem of the mistletoe differs essentially from that of the tree on which it grows. In the April No., Dr. Crozier, of Louisville, Ky., tells of the destruction of forests of black walnut by the American mistletoe (Phoradendron flavescens, Nutt.).—2. *Field and Forest* for Feb. has notes on the preservation of fungi, by M. E. B., and an interesting account of Botany at the Centennial Exhibition, by Dr. Vasey.—3. *Botanical Gazette:* The February No. contains a list of Illinois lichens, by J. Wolf; a useful notice of changes in botanical nomenclature since the publication of the last edition of Gray's Manual, by Dr. Porter; a continuation of Dr. Garber's botanical rambles in East Florida; and a list of additions to Mr. J. Schneck's Flora of the Lower Wabash Valley. In the March No., Dr. Porter describes a new species of Prunus (*P. Alleghaniensis*), from Western Pennsylvania: "Stone turgid, somewhat obovoid, with a blunt point, a shallow groove on one side, and a broad flat ridge on the other. Nearly allied to *P. maritima*, Wang. *var.* b. T. & G. (*P. pygmæa*, Willd.). Mr. Elihu Hall commences a list of the trees and shrubs of Oregon; Mr. Austin gives Bryological notes; Mr Green records *Verbascum Thapsus*, L., *Lepidium Draba*, L., and *Datura Tatula*, L., as introduced into California; and Mr. Schneck an interesting discovery of root leaves of Alisma Plantago.—4. *Onion Smut:* An Essay presented to the Massachusetts Society for Promoting Agriculture, by Prof. W. G. Farlow. This new fungus (*Urocystis Cepulæ*, Frost, MS.) seems nearly confined at present to New England, where it is becoming mischievous, and is supposed to be derived from some wild onion.—5. Prof. Farlow sends us also, *Remarks on some Algæ found in the water supplies of the City of Boston.*—6. *Woolson & Co.'s* Price List and *Descriptive Catalogue of Handy Perennial Plants.* Passaic, N. J., P. O. Box 180.—7. *Forest Culture and Eucalyptus Trees*, by Elwood Cooper, San Francisco, Cal., contains, beside the lecture on the subject by Mr. Cooper, descriptions of 32 varieties of Eucalyptus, from Ferd. Mueller, of 22 varieties, from a Sydney catalogue, and several spirited lectures of von Mueller's on forest culture.—8. In the recent numbers of the *American Naturalist*, among the usual variety of interesting botanical notes, we notice a List of the Lichens growing within twenty miles of Yale College, by Franklin W. Hall.—9. *Report of the Botanist*, Charles H. Peck, from the 27th Annual Report of the New York State Museum of Nat. Hist., for the year 1873, published in the report, Dec., 1875. Together with the account of new fungi, Mr. Peck gives suggestions in relation to their collection and preservation. *Aconitum Napellus*, L., seems to be established in Ulster Co., *Botrychium Lunaria*, Swartz, was found by Mr. Mundy, near Syracuse, *Rhododendron maximum*, L., by O. S. Phelps, near Chapel Pond, Essex Co. Small flowerless specimens of *Campanula rotundifolia*, L., collected near Port Jervis, have the rounded leaves on the upper part of the stem, the linear leaves below them. There are two fine plates, in one of which is an illustration of *Sphæria Arceuthobii*, Peck, with the host plant on its own host. Mr. Peck detected also a parasite of the third degree, a minute white mold on the perithecia of the fungus.—10. *Psyche*, having reached its 32d No., publishes an index of its first volume.—11. *Proceedings of the Academy of Natural Sciences of Philadelphia*, Oct.–Dec., 1876. Mr. Meehans remarks on the difference, in many species, between early and mature leaves, in regard to the greater or less amount of division. After citing many other cases, he applies his observations to mature trees of *Liriodendron* which have preserved the entire leaves of the youthful stage. He looks upon them as cases of arrested development, as would appear, he thinks, from their more slender growth and absence of seed cones.—12. *Les Collections Botaniques du Museé Royal de Physique et dè Histoire Naturelle de Florence, au printemps de* 1874, by Philippe Parlatore, Florence, 1874. A full and systematic account of the Florence Herbarium at the time of the Botanical Congress in Florence, May, 1874.—13. *Transactions of the Massachusetts Horticultural Society, for the year* 1876, *Part II.*—14. *Schedule of Prizes* offered by the same for 1877.—15. *Flora exsiccata of St. Louis, Mo.* Mr. H. Eggert, 918, Washington St., St. Louis, offers to those who wish to buy from his collection of about 500 species the privilege of choosing from the list such plants as they desire at 6 cents per species in full and complete specimens. Mr. Eggert refers to Dr. Engelmann.—16. *Naturalists' Directory*, containing the names of Naturalists, arranged alphabetically, with an index arranged according to departments, and interleaved for additions. It contains the names of about 330 botanists. Naturalist's Agency, Salem, Mass. This Agency undertakes to supply naturalists with books, instruments, material, etc.

§ 154. **Sycamore.**—It is well known that in England this name is given to a species of Maple, *Acer Pseudo-Platanus*, L., while in this country the Button-wood, *Platanus occidentalis*, L., is the popular Sycamore. The true Sycamore, *Ficus Sycamorus*, L., a native of Egypt and Palestine, has oval, cordate, entire leaves, having no resemblance to either the Plane or the Maple. We have never been able to learn the history of this confusion of names.

Terms—One Dollar per annum beginning with the January number. For the Botanical ***Directory** 30 **cents Supplement to Directory,** 10 **cents. Vols. I.-V., with index, and*** *photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club,* 25 *cents. Address,* Wm. H. Leggett, 224, *E. Tenth Street, New York. Money Orders on Station D, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* Dr. Thurber, *the President of the Club,* ***may be found at** 245 **Broadway.***

Vol. VI., No. 29.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, May, 1877.

§ 155. Botanical Geography of Syria.[1]

Syria is a geographical expression for the country bounded on the north by Mt. Taurus, on the south by Arabia Petraea, on the west by the Mediterranean, and on the east by the desert plains which lie between it and the Euphrates. Few regions, not insular, have such pronounced limits, and few therefore offer such decided characters to the Naturalist. Furthermore, in proportion to its extent, Syria presents more diversities of elevation, soil, climate, and scenery than any country in the world. Its mountains are almost alpine. It has tropical valleys, miniature steppes, rolling slopes, maritime plains, terraced Italian hills, Scottish highlands, a desert on the south, and a boundless tableland on its eastern border, all in a space not larger than the State of New York. Moreover, as the meeting point of three continents it shares the flora and fauna of all. On Lebanon are types which are borrowed from the Carpathians and the Caucasus on the one hand, and the Himalayas on the other. On the sea coast are genera and species shared with Mediterranean Europe and Africa. In the Jordan Valley and around the Dead Sea are Indian and African types in tropical luxuriance. When the Flora of this land comes to be written, it will be seen that no part of the earth's surface of equal extent embraces so cosmopolitan a collection of the great vegetable types and so copious a flora. The history of Nature is epitomized in the microcosm of Syria as well as the history of humanity.

A glance at the map of the eastern Mediterranean and adjacent regions will show a long coast-line, extending with few indentations from Iskanderuna (near the battle-field of Issus) to the Nahr el Arish, the ancient "river of Egypt." At a varying distance, never exceeding a few miles, from this line of coast is a range of mountains beginning with Mt. Casius, an isolated peak 5318 feet in height, situated between Antioch and Lattakia. This range extends southward through thé country of the Nusairiyeh, attaining a volume and elevation similar to the Catskills, and ending in a stony plain in the latitude of the ancient Arvad. This plain, which runs east and west and is traversed by two considerable river beds, is about ten miles in breadth (*i. e.*, from north to south) and thirty in length (*i. e.*, from east to west.) It is coterminous with the the littoral plain on the west, and Cœle-Syria on the east. It attains an elevation of about 1000 feet.

To the south of this plain rises abruptly the steep north wall of Lebanon, and but a few miles south are the highest peaks of the range, Jebel Makmel, Fim el Mizab, and Dhohr el Kodhib, which attain an elevation of more than 10,000 feet above the Mediterranean.

Lebanon terminates southward, with almost equal abruptness, at a point near the latitude of Sidon. A gap similar to the one dividing the Nusairy mountains from Lebanon separates Lebanon from the hill country of Galilee. The range which constitutes the backbone of Palestine begins at the headland known as Shukif, the Belfort of the middle ages, and stretches southward through Galilee, Samaria, and Judea to Arabia Petræa.

[1] See p. 164,

These three ranges, which but for the gaps above mentioned would be one, differ in height. The Nusairy range, and the mountains of Palestine are about of equal height and general physiognomy, but Lebanon towers to triple their height, and in the boldness of its scenery and the grandeur of its peaks rivals the greater mountain chains of the earth.

Eastward of the Nusairy range is a broad plain, watered by the Orontes, and flanked on its eastern border by a low range of hills which separates it from the desert.

At Hems, (ancient Emesa) the northern gaps of the seacoast chain (*i. e.*, between the Nusairy Mountains and Lebanon) joins the plain of Cœle-Syria at a right angle, and sweeps eastward into the desert, between the range of hills above alluded to and Anti-Lebanon.

South of Hems, at Kamoa el Hurmul, where there is a famous Assyrian monument, begins the valley of the Bukaa or Cœle-Syria. This bed of an ancient lake is about 120 miles in length, and terminates near Hasbeiya in a vast dyke, through which the Litany has broken on its headlong way to the sea. East of this plain, which at its widest part may be 12 miles broad, is the range of Anti-Lebanon, terminating in Jebel esh Sheikh, as the Arabs reverently call the silver crown of Hermon. Anti-Lebanon is lower than Lebanon, but Hermon over tops the highest peaks of the sea-coast range, being over 11,000 feet in height.

From the dyke which terminates the valley of Cœle-Syria to the southward, a space of 15 miles is occupied by the region of Merj Ayun, a fertile plain, connecting the coast with the region of the Huleh. This cross valley has relations with the southern extremities of Lebanon and Anti-Lebanon, similar to those of the valley which divides them from the Nusairy Mountains and their parallel range in the north. Eastward it winds around the foot of Hermon, and forms the route of access to the plain of Damascus and the Hauran, and southward it merges into the marshes of the Huleh, the proper commencement of the Jordan valley. This valley, gradually increasing in depth, becomes a canyon, terminating in the cliffs of Usdum, south of the Dead Sea. At its lowest part this valley is 1,300 feet below the Mediterranean. Eastward of the Jordan valley are the ranges of Bashan, Gilead, and Moab, abutting upon the northern spur of the Sinaitic range. Eastward of this range stretches away the great Syrian desert.

Syria therefore consists of two great mountain chains, stretching from north to south, divided by a valley of varying breadth and depth. The western range is flanked by the sea-coast plain, and the eastern by the table land known as the Syrian desert. Two cross valleys equidistant from the extremities of the chains, and from each other, subdivide each of these chains into three of equal length, of which in either case the central is far the grandest and most imposing. These valleys likewise form a highway of communication between the coast and the interior.

The meteorology of Syria results from its physiography and is briefly as follows: At Beirut, midway between the northern and southern limits of the coast line, the average summer day temperature is about 84° F., and the average winter day temperature about 65° F. At an elevation of 2,500 feet the average sinks about 10° F. Snow never falls at Beirut, and never rests long lower than 3,000 feet. At a level of 5,000 feet on the Damascus road the way is often blocked for days by drifts, in which men and animals occasionally perish. Snow is found in isolated banks on the high peaks of Lebanon and Hermon throughout the year.

From April to November there is seldom any rain. The "early rains" of November are followed by fair weather, during which the farmer ploughs and sows. The "latter rains" begin to prevail in December, and last with violence from December 15 to March 1. Slighter rains fall in March, and then comes the not very high but sustained temperature of the long summer. During the brief rainy season from 32 to 40 inches or more of rain are poured upon the western water shed. But the cloud banks which roll massively up the sides of Lebanon often dissolve at its summit into fleecy mist, so that Cœle-Syria and its continuation north and south enjoy far less rain than the coast range. The Ghor of the Dead Sea dissipates all vapors, and remains a perpetual desert, except where springs having their origin in distant water-sheds nourish a few oases in the ravines of its rocky walls. Anti-Lebanon extracts still more of the moisture of the clouds, so that the rain-fall of Damascus, and the desert are not more than half that of the coast. Should the storms, which during the winter deluge Western Lebanon, be let loose upon the mud walls of Damascus, they would dissolve into their original loam.

The prevailing wind of the summer is West by South. When in winter, a few more points of southing are maintained for many hours, the warm Sahara wind, which has lapped up the moisture of the sea, and become surcharged with vapor, striking the cool strata of Lebanon, pours out its treasures of rain in torrents. It is only when the force of the impact carries the clouds over Lebanon that Cœle-Syria and Anti-Lebanon share the supply. In the spring, the hot wind (sirocco) from the eastern table-land, which stretches unbroken by mountains to Persia and the desert of Cobi, aids the unfolding of the leaves, while it parches the surface of the rainless fields. In early autumn the cold, dry wind from Taurus sweeps down the coast, and often blights plants which the siroccos of the spring time, and the fierce sun of summer have spared.

The soil of Syria likewise varies. The sea coast plain is a dark brown loam. That of Cœle-Syria resembles the soil redeemed from lacustrine basins, with its treasury of organic fertilizers.

The soil of the mountain, where unterraced, is thin and poor, being composed of loam mingled with the debris of limestone disintegration, through which dykes of sandstone crop out, the red soil of which contrasts with the grey limestone rocks of the general face of the chain.

On the sea coast are dunes of blown sand, and about Hems and in the Transjordanian region the soil is largely mingled with volcanic debris.

Syria may be divided botannically into seven well marked regions.

1. *The dunes.* These hills of blown sand are charcterized by Glaucium luteum, Tamarix Pallasii, Medicago maritima, Lupinus angustifolius, L. tenuis, Euphorbia paralias, Saccharum Ægyptiacum, and Cyperus Ægyptiacus.

2 *The littoral plain.* This is characterized by the gay Ranuculus Asiaticus, with broad scarlet and crimson flowers, Anemone coronaria with varieties from white to blue, purple, and scarlet, Papaver Syriacum with crimson flowers, shaded at the base of the petals with almost black pigment; these three species alone illuminate miles of the landscape of Palestine in early spring time; Fumarias with delicate translucent stems, and graceful clusters of beautifully tinted flowers; a multitude of Cruciferae, for the most part annuals, with inconspicous flowers, but various and often beautiful fruits; Capparis spinosa (not the source of the reed on which the sponge of vinegar was offered to our Saviour); Reseda alba and R. odorata (run wild); Cistus salviaefolius and Helianthemum salicifolium; many Sileneae, of which S. Atocion alone covers acres of moist ground in the spring. Most of the Sileneae have dry stems, and few of them have attractive flowers; Herniaria hirsuta; a few Malvaceae, among them a poor grade of cultivated Cotton, and, of the wild species, the showy Lavatera punctata and Althæa digitata; Linum Syriacum and L. orientale with yellow blossoms and L. pubescens with pink; many Erodiums, as E. gruinum, E. moschatum, several inconspicuous Geraniums; Haplophyllum Buxbaumii; Vitis vinifera; a multitude of herbaceous Leguminosae, especially Medicago, Lotus, Trifolium, Trigonella, Melilotus, and Vicieae; a few introduced Acacieae, Parkinsonia aculeata, Poinsettia, (near the large cities) [perhaps Poinciana is meant.—Eds.]; Calycotome villosa (plaited and sold in Jerusalem as Spina Christi); all the usual Rosaceous trees, Poterium spinosum, (another candidate for the position of Spina Christi); Myrtus communis; a few gay Epilobiums; Lawsonia inermis, (the Henna plant, the Camphire of Scripture); Ecbalium Elaterium, the Squirting Cucumber, Citrullus Colocynthis, Bryonias with berries; a few Sedums; multitudes of Umbelliferae, many with fine, well-marked fruits; Lonicera Etrusca; vast numbers of Compositae, many of them horrent with thorns, as Cyclops, Centaurea, Kentrophyllum; Anagallis arvensis, a variety with large blue blossoms and spreading stems; pretty Campanulas; Cyclamen Aleppicum, hiding its bulb in every cleft of rock or inter-space in the stone walls of the fields; numerous Plantagos; one or two showy Orobanches and Phelipæas; an Acanthus; several Scrophularias Verbascums, Linarias and Antirrhinums; Verbenas; multitudes of highly aromatic Labiates, among them Origanum Maru, L., (which may be the Hysop that grows on the wall); some scentless Heliotropes, and the weedy types of the Borraginaceae; Convolvuli and Evolvuli, the Scammony plant, and sundry Cuscutas; Mandragora, Physalis, and several other genera of Solanaceæ; a few Sabbatias; Oleander; Olea; Phytolacca decandra; Chenopodiums, Salsola;

Amarantus; several insignificant Polygonums; Loranthus; Euphorbias, Crotons, Ricinus communis; evergreen Oaks; Alnus orientalis; a few Salices; Platanus orientalis; Urticaceae, Ficus Carica and F. Sycamorus, (Zaccheus' Tree); Morus (the silk-worm variety and others); Pinus Pinea, and P. Haleppensis, Cupressus; Palmeae; Araceae; Typha; Alisma Plantago; Hydrocharidaceae; a few small Orchids; Musa; a few Irises, some of gorgeous colours; Tamus communis; Smilax Mauritanica; a few Tulips; some Melanthaceae; a sprinkling of the simpler monocotyledons, though less numerous than in more humid climates, among them however is the magnificent Arundo Donax, 15 feet in height. Of Filices, Adiantum Capillus-Veneris, Grammitis leptophylla, Ceterach officinarum, Polypodium vulgare, Asplenium Adiantum-nigrum, Pteris longifolia, Nephrodium pallidum, Cheilanthes odora, the world-wide Asplenium Trichomanes; a few Selaginellae; many, as yet unstudied, Mosses and inferior Cryptogams.

3. *The median mountain region.* This region comprehends the mountain slopes from the level of the plain to a height of 6,000 feet. Added to the flora of the plain, are many characteristic species, as Anemone blanda; Ranunculus cuneatus; Delphinium Anthoroideum; Bongardia Chrysogonum; Erysimum gonocaulon; Hesperis pendula; Viola sylvatica; Gypsophila Libanotica; Rhammus alaternus; Acer Monspessulanum, A. Hyrcanum, *γ*. Reygassei, A. Syriacum; thorny Astragali as A Drusorum; Erica manipuliflora [E. vagans, L., var.] (confined to a zone of altitude from 1,000 to 2,000 feet on rocks facing to the north), many interesting Umbelliferae, as Prangos asperula, Carum elegans, Pimpinella peregrina; Eryngium glomeratum; many spring Compositae as Cyclops, Kentrophyllum, and Atractylis; Labiatae, as Origanum Libanoticum, Stachys Italica, Thymbra spicata, Lavandula Stœchas; Juglans regia; Quercus Cerris; many Colchicums, Crocuses and Orchids; a few grasses and sedges, and added to the ferns of the littoral region, the world-wide Pteris Aquilina, Osmunda regalis, Blechnum spicatum, Nothochlæna lanuginosa, Asplenium Bourgæi, Scolopendrium officinarum, and S. Hemionitis.

Anti-Lebanon corresponds in a general way with the lower Lebanon. Its botany, as that of the Nusairy Mountains, remains to be studied.

4. *High Lebanon and Hermon.* This region is subalpine, and contains such characteristic plants as Ranunculus demissus, R. crymophilus; Papaver Libanoticum; Corydalis rutaefolia; Hesperis Kotchyana, Aubretia Libanotica, Draba Vesicaria; Dianthus Libanoticus; Gypsophila hirsuta and G. mollis; Viola Libanotica, V. ebracteolata; Astragalus dictyocarpus, A. Hermonis; Vicia canescens; Pimpinella tri-radiata. Eryngium Heldreichii; Primula acaulis; Acantholimon Libanoticum; Larix Cedrus. These mountains share the floras of both the Caucasus and Himalayas.

5. *Cœle-Syria.* This elevated lake bed, opening north at Hems into the table land which bounds Syria to the east, and southward into the plain of Merj Ayun, exhibits characteristics of the lower mountain floras of Lebanon and Anti-Lebanon, and during the dry season some of those of the great Syrian desert. Along the rivers

Orontes and Leontes, grow Platanus orientalis, several species of Salix, and many herbaceous plants calling to mind the gardens and fields about the great cities. In the arid plains at a distance from the water-courses, after the luxuriant vegetation of spring following the winter rains, the parched soil is possessed by such plants as Sterigma sulphureum; Althæa rufescens (found also in the desert); Haplophyllum fruticosum (found between Hems and Palmyra); Astragalus Rousseanus, Astragalus demi-acanthus (a species with long thorns); Peganum Harmala; Centaurea dumulosa; Phlomis Armeniaca, Stachys nivea, Marrubium cuneatum; Euphorbia Szowitzii and E. lanata; Stipa Eherenbergii (found on the road from Hama to Palmyra).

6. *The valley of the Jordan and the Desert Sea.* This strange valley, far below the adjacent Mediterranean, with its mysterious sea of azure water, adds to the arctic, temperate table land, and sub-tropical flora of Palestine a tropical element. Calotropis procera and Salvadora Persica are Indian plants, equally common in upper Egypt and Nubia. In his paper on the Dead Sea vegetation, Mr. B. T. Lowne remarks, "On examining the list of plants which I found in this region, it will be seen that the flora, although very different from the flora of the rest of Palestine, is essentially Mediterranean in type. Its affinities however, are all with the flora of Northern Africa, especially with the desert floras of upper Egypt and Nubia. It will also be found to be closely related with that of Aden in the south, and the Canaries in the west * * of the 94 species collected by myself in the south of the Dead Sea valley 29 or 30 only are European plants. On the other hand over 50 species are decidedly African, not extending into Europe. Between 30 and and 40 of the species of the southern Ghor extend into Sind, and about 13 are found in the Canary Islands; this appears to me to be a fact worthy of note, since these countries are upon the eastern and western limits of the North African desert-flora. Eleven of the most characteristic plants of the southern extremity of the Dead Sea valley are common to it and to the peninsula of Aden; and considering how very limited the floras of the two localities are, this is not an unimportant number."

Of the characteristic plants of this region we have Cleome trinervia, Fragaria Sinaitica, Mathiolia oxyceras, Nitraria tridentata, Retama retam, Acacia Sêyal, Salicornia fruticosa, Moringa aptera, Calotropis procera, Salix octandra, Salvadora Persica.

7. *The Syrian Desert* This region, which enjoys a rain-fall of perhaps ten or fifteen inches, is no desert during the winter months, but a most luxuriant landscape of grasses and other forage plants which afford subsistence to the large flocks and herds of the Bedawin. Its flora has affinities partly with that of Cœle-Syria, and partly with that of Arabia Petræa. The extreme difficulty of travelling through this most inhospitable waste has prevented the adequate study of the most interesting flora. M. Blanche of Tripoli, Syria, and Prof. Paine of the Palestine Exploring Society, have collected part of the plants of the table land, the former in a journey from Hems to Palmyra, the latter in his long residence in Northern Moab in

1873. The following are typical plants of this region. Of M. Blanche's collection; Silene gonocalyx, Habrosia spinulifera; Althæa rufescens; Haplophyllum fruticulosum; Astragalus tribuloides; Dipterocoma pusilla; Stipa Ehrenbergii. Of those reported by Prof. Paine there are several described as new species; Silene brevipes; Trigonella minima; Trifolium velivolum; Cephalaria tenella; Cerinthopsis foliosa; Phelipæa incana; Salvia Peratica; Plantago Cretica, β. tomentella; Plantago Phaeopis; Gagea monticola; Allium lachnophyllum; Carex eremitica; Bromus argypheus. Further study and extensive collections alone can determine the peculiarities of the desert flora.

In its general characteristics, climatic and botanical, strong resemblances may be traced between Syria and California. The same wet winters and dry summers, with breezes from a western sea, blowing over mountains, mostly bare of forests, and plains fertile only through irrigation; the same hot sunshine, and the proximity of lofty mountains to semi-tropical valleys, produce analogies in vegetable life, which the writer hopes to trace in a subsequent paper. Without doubt, as the range of our knowledge in Geology and Botany increases, the knowledge of the lines of descent and analogy will extend, not merely to species and varieties, but to the mode of the formation of the continents, and the reasons for the distribution of plants, which are deprived of volition in their establishment and diffusion, as well as for the migrations of animals, which superadd to organic life, some degree of self-determined will.

§ 156. **International Botanical and Horticultural Congress.**—The Botanical Society and the Central Horticultural Society of France, propose to hold, during the Paris Exposition of 1878, a Botanical and Horticultural Congress, at Paris, from August 16th to the 22d, inclusive. Botanists of all countries are invited, and those who propose to be present at the Congress, are requested to announce their intention to M. A. Lavallee, President of the "Commission of Organization," Paris. In the list of members of the Commission are the well-known names of Baillon, Planchon, Duchatre, Cosson, and other French botanists, with those of equally prominent horticulturists.

The Commission desire that the widest possible publicity be given to the proposed plan. G. T.

§ 157. **Botanical Papers.**—Doct. A. Engler, of the Botanic Garden of Munich, Bavaria, is one the Editors of Dr. Just's "Annual Review." He complains that, by the usual channels, contributions and publications are sometimes very long in reaching him, and requests that the authors of papers and botanical notes forward copies of their publications directly to him. His special departments are: the geographical distribution of plants, and the morphology and the systematic botany of Phanerogamous plants. G. T.

§ 158. **Suffolk County Notes.**—I was interested in a note, Upon the appearance and disappearance of plants, by Mr. Edwards, in a recent No. of the BULLETIN. I have had similar experience, though mine has not been so pleasant. I have to record more the disappearance than the appearance of those I have sought. I have looked in vain for many plants which would be likely to be found here, but have failed to find them, though I have been rewarded by discovering species new to me and often of more interest than those I sought.

While looking for plants at River Head I found, very unexpectedly, *Botrychium simplex*, Hitch. I find it every year in the same place, though never anywhere else. I think it is not so rare as is generally thought ; being small and green, it is easily overlooked. Mr. Young and myself found *Rhyncospora nitens*, Gray, very plenty at Long Pond, near here, in 1872. We have never been able to find it since. We found at the same place, the same year, *Polygonum Careyi*, Olney, very plenty. The next year we found a few specimens. Since then we have not observed a sign of a plant. I found once a single specimen of *Aster Novae Angliae*, L., at Long Pond. I gathered the cluster of flowers, but was particular to leave the root. I have never been able to find it again. Long Pond is the only locality where I can find *Galactia mollis*, Mx. I found *Utricularia gibba*, L., there for a year or two, but don't find it now. In 1872 I found two or three plants of *U. resupinata*, Greene, growing on a floating mass of Nymphæa roots and mud. The same year I found it at Deep Pond, about a mile from Long Pond. The little purple flowers were so thick on a square rod of ground that they showed plainly at some distance. I have searched eagerly for it in that spot every year since, but in vain. I found, at Deep Pond, the same year, *Oldenlandia glomerata*, Mx. ; that, too, has disappeared. *Potamogeton Robbinsii*, Oakes, grows in Deep Pond. I have only examined fragments which I have picked up along the shore. There is no boat in the pond, and it is very deep, in some places 40 feet. I used to find *Reseda luteola*, L., and *Verbena officinalis*, L., in the streets at Mt. Sinai, but they have both been destroyed. *Mentha aquatica*, L., var. *crispa*, Benth., has too strong a hold there to be easily destroyed. I have found one plant, each of *Asclepias variegata*, L., and *Asclepias phytolaccoides*, Pursh, here, but they have both been destroyed. Mr. Young found the latter at Northville. A large patch of *A. purpurascens*, L., grows near Deep Pond. I never saw it flower but once, and then it did not mature any fruit. *Chenopodium glaucun*, L., is a weed in a garden near the Sound. *Celtis occidentalis*, L., is very plenty at Stony Brook, on the farm of Mr. Thos H. Hadaway. I find *Betula papyracea*, Ait., about here. It flowers before the leaves expand, while *B. alba*, L., var. *populifolia*, Spach, does not flower till the leaves are half grown. I have never been able to find more than one specimen of the typical form of *Juniperus communis*, L. The var. *depressa*, Torr., is very common. I occasionally find *Matricaria inodora*, L., when I am mowing. As it is cut before the seed ripen it is not likely to increase very fast. I went to Babylon last spring to collect *Linnaea borealis*, Gronov. I followed closely the directions where to find it, given in the BULLETIN by Mr. Merriam. I searched long and diligently, but failed. I feel quite sure it is entirely destroyed, for a fire had passed over the spot a year or two previous to my search, and destroyed everything above ground. As the roots do not grow very deep they were probably killed. I find *Rosa micrantha*, Smith, at Port Jefferson. *Prunus spinosa*, L, I find here, but it does not flower, and it flowers very sparingly at Northville. It is very plenty about East Hampton. I have long heard that the Sugar Maple, *Acer saccharinum*, Wang., grew on the cliffs near the Sound, at Baiting Hollow, so I went to see for myself. The trees were all cut down about three years ago. Some of them were from 15 to 18 inches in diameter. Only one or two have sprouted, but there are plenty of seedlings, so I think they are established. They were not on the cliffs, but at their foot, on the inner or south side. The hill was about 50 feet high, very steep, and in the shape of an ox-bow. The trees were in a very warm and sheltered place. Near there, I am told, a single specimen of Tulip Tree, *Liriodendron tulipifera*, L., once grew, but it has been cut down. The young ones are coming up thickly. I know of but one other in the country that is near here. I once found a single specimen of *Vaccaria vulgaris*, Ait., in a field of grain. A single specimen of *Camelina sativa*, Crantz, is all I ever saw here, and so of *Arabis perfoliata*, Lam. I saw once a plant of *Amorpha fruticosa*, L., growing at Mt. Sinai, but it has been destroyed, and I have never seen any more. I have recently found here *Allium tricoccum*, Ait., *A. Canadense*, Kalm., *Ranunculus repens*, L., and *Barbarea praecox*, R. Br. I have just found *Adiantum pedatum*, L., near East Hampton. I find *Arethusa bulbosa*, L., growing in great abundance in the swamp adjoining Hook Pond, in the village of East Hampton. I gathered several hundred specimens in a very small part of the swamp. No one need have any fear of destroying that locality by collecting specimens.

ELIHU S. MILLER.

WADING RIVER, *June* 10, 1877.

§ 159. New Hepaticæ, by C. F. AUSTIN.

Riccia Donnellii, *n. sp.*—Dioica maxima; fronde solida esquamosa subglauca superne maxime reticulata subtus concolore, laciniis subsimplicibus pro more discretis planiusculis siccitate canaliculatis costatis margine spinulis (serie singula) breviusculis hyalinis valde incrassatis obtusis patentibus armatis, nervo solidissimo valde incrassato subtus in media fronde terminante apice valde incrassato obtuso subdescendente, sporangiis serie singula in media fronde versus basin sitis, sporis maximis subrotundis nigris valde opacis subtuberculatis; involucris masculinis magnis valde prominentibus subbasilaribus.—In a garden at Jacksonville, Florida, Feb., 1877.—*J. Donnell Smith.*

Sphærocarpus Donnellii, *n. sp.*—A congeneribus distinguitur sporis majoribus grosse tuberculatis (aterrimis) cocco profundius lobato, fronde masc. lobis subspiciformibus involucris creberrimis exasperata.—Gardens, etc., Florida, Feb.–Mar., 1877.

The large tubercles of the spores are fragile. Coccus deeply lobed, about $\frac{1}{150}-\frac{1}{175}$ of an inch in diameter, sometimes quite fragile;

spores about $\frac{1}{250}$–$\frac{1}{325}$ of an inch in diameter. The male and female fronds often grow together. The male frond is much narrower, of an amber brown, with a stipe-like base and with spike-like lobes, and is a most beautiful object under the lens. When crowded the female fronds also have a substipitate base and leaf-like lobes, very much as in *Fossombronia*.

Sphærocarpus Texanus, *n. sp.*—A *Sph. Michelii* distinguitur fronde minore, involucro apice minus obtuso, sporis fere dimidio minoribus, etc.—Texas, 1849.—*C. Wright.*

Coccus about $\frac{1}{400}$ of an inch in diameter (smaller than a single spore of *S. Donnellii*). Involucre and lobes of the frond slightly acuminulate. Male frond not seen. *S. Michelii* has the coccus about $\frac{1}{200}$–$\frac{1}{250}$ of an inch in diameter, not very distinctly lobed. Involucre and lobes of the frond obtuse or subtruncate.

Lejeunia Jamesii, *n. sp.*—Muscicola; caule vix lineam longo vage ramoso repente, foliis ovatis acutiusculis planiusculis integerrimis, cellulis haud convexis sed dorso longiuscule papillosis, lobulo majusculo inflato subnullove, perianthio——.

On the leaves of *Neckera glabella.*—Mexico.—*James.*

A very minute species, the leaves less than the $\frac{1}{100}$ of an inch in length.

§ 160. **Publications.**—1. *Algæ Exsiccatæ Americæ Borealis: curantibus W. G. Farlow, C. L. Anderson, D. C. Eaton editæ. Fasc. I.* This fasciculus consists of fifty specimens, with nicely printed tickets, of North American Florideæ and Chlorosporeæ, or Red and Green Seaweeds. The edition consists of only thirty copies, of which about twenty are for presentation to the leading Phycologists of America and Europe, to certain Museums, etc., leaving ten copies for sale at $8.00 per copy. The fasciculus includes many rare and very interesting species, as, for instance, *Dasya ramosissima*, from Key West, *D. plumosa*, California, *Nitophyllum violaceum*, California, *Lomentaria* tr. *rosea*, Gay Head, *Cryptonemia crenulata*, Key West, *Farlowia compressa*, California, *Callithamnion dasyoides*, California, *Caulerpa*, several species from Key West, *Hormactis Farlowii*, Wood's Hole, etc. This fasc. is in smallish 4to; the next one will probably be in folio, with *Sargassa*, *Fuci*, *Laminariæ*, etc., and the price of it will be $12.00. Other fasciculi are expected to follow at intervals, until the greater part of our marine Algæ have been distributed. Professor Farlow (*Harvard Univ., Cambridge, Mass.*) has charge of the distribution and sale of the copies.—2. *Botanical Contributions*, by Asa Gray. Proceedings of Am. Acad. Arts and Sci., Vol. XII. *Canotia holocantha*, Torr., Dr. Gray concludes to belong to the Rutaceæ. *Sympetaleia, nov. gen.*, is remarkable among Loasaceæ for the union of the petals, as the name implies. They are combined into a long tube, with the stamens borne in and below the throat. *Lemmonia*, a new Hydrophyll, is named after the energetic botanical explorer of the Sierra Nevada. *Echinospermum Greenei*, is the type of a section *Echinoglochin*. *Echidiocarya*, with its character reconstructed, and with two species, is placed between Eritrichium and Antiphytum. *Leptoglossis*, subgenus *Brachyglossis*: the two species here given are L. Texana, and L. Coulteri, the former has two names in Bot. Mex. Bound, Nierembergia (Leploglossis) viscosa, and Browallia (Leptoglossis) Texana. It was probably intended that the first should be cancelled.—3. *Quelques Points de Nomenclature Botanique*, par Alph. De Candolle and A. Cogniaux, from Bull. Soc. Roy. Bot. Belg. Vol. XV. 1876. "The father of the laws of Botanical Nomenclature," in answer to questions of M. Cogniaux, reminds him that the name of an author appended to an order, genus, or species, or any sub-section, is there not as a matter of praise or censure, but as a simple reference to the fact, that the author cited, is the authority for the name or the combination of names. If, for example, he merely forms, or remodels a genus, without naming the species under it, whether old or new, he is only to be quoted as authority for the genus; but if he takes the species into view, he is authority for the combination, although he retain the old specific names. For instance, Bentham has reduced as many as thirty genera to the one head, Peucedanum. There might be among these discarded genera, three having a species *dissectum*, if, Bentham applies this name to Peucedanum, it is plainly proper to quote P. dissectum, Benth., for that is the fact to be stated.—4. *Catalogue of Phænogamous and Acrogenous Plants*, found growing wild in Michigan, compiled by Elmore Palmer, M.D., Dexter, Washtenaw Co., Mich., 16 pages, of two columns, about 38 plants to a column, or about 1,000 species to the end of Lycopodiaceæ.—5. We have received from *Richter Lajos*, Budapest, Erzherzogin Maria Valerie Gasse, No. 1, Hungary, a duplicate copy of his very extensive exchange catalogue, the condition of which exchange were noted in our BULLETIN, Dec., 1876, § 134.—6. *Transactions of the Massachusetts Horticultural Society*, 1877, Part I. Meetings and Discussions to the end of March. Full of interesting matter, Squash and Melon Culture, by J. W. Pierce, Fertilization and Cross Fertilization, by Prof. Goodall, etc.—7. *American Journal of Science and Arts:* The May No. has an article on the History of *Helianthus tuberosus*, by Drs. Trumbull and Gray. Dr. Trumbull's historical investigations seem to make it clear that it was obtained from the Canadian Indians, and corroborate Dr. Gray's conclusion that it is a cultivated *H. doronicoides.* Dr. Gray adds that he has for some years been convinced that the annual Sun-flower, *H. annuns*, said by Linnæus to come from Peru and Mexico, is the *H. lenticularis* of Douglas, which again is probably only a larger form of *H. petiolaris* of Nuttall, natives of the western part of the Mississippi valley and of the plains, to and beyond the Rocky Mountains." According to Dr. Trumbull's citations from Sagard and Champlain, it was cultivated by the Huron Indians for the oil of its seeds, which they used as hair-oil. In the botanical notes, Dr. Gray proposes the terms *eutropic* and *antitropic* to express the direction of a twiner, the former meaning with the sun, the latter contrariwise. Those who possess Elliott's Botany will value the dates of publication ascertained in this and the January No. There is in this No. a very interesting notice of a paper in the Linnean Journal, by Bentham, on *Classification and Terminology in Monocotyledons.* In the June No. Dr. Gray has a notice of Beccari's *Organogenia dei fiori feminei del*

Gnetum Gnemon, the latter part of which we quote as of particular interest for its bearing on discussions of evolution and development. "In flowers so little differentiated as those of *Coniferæ*, the distinction between ovular and carpellary envelopes may be really not cognizable because not yet actual, and so the question may be one of words; while in *Gnetaceæ* an important advance is made, and the ground of a distinction between ovular, carpellary, and perianthial envelopes begins to appear. If this be so, a vexed question in classification may find a practical settlement. The cultivators of fossil botany, finding that Gymnosperms were far the earliest phænogamous plants, and that no angiospermous Dicotyledons have been detected until long after the appearance of Monocotyledons, almost universally treat the Gymnosperms as a primary division or class of the Vegetable Kingdom. They are seconded by the histologists or organogenists, who naturally make the most of those interesting points of structure which they have brought to view, and which approximate the Gymnosperms to the Vascular Cryptogams. But the question whether Gymnosperms are a part—the earliest and simplest part—of the great class of Dicotyledons, or whether they constitute an independent class or primary group, must be determined by broad and general considerations of the whole structure. Now the transition from *Gnetaceæ* to Angiospermous Dicotyledons is obvious and apparently real. If no transitions are extant between the Gymnosperms and Cryptogams, and if—as is clear—the former are truly Dicotyledonous and exogenous in structure, and have greater affiinity with the Angiospermous Dicotyledons than they have with the Monocotoledons, then the taxonomist would appear to have good grounds for concluding that the proper division of the vegetable kingdom is, first into *Phanerogamia* and *Cryptogamia*; then the former into Monocotyledons and Dicotyledons, then these last into Gymnosperms and Angiosperms.—8. The *Botanical Gazette* continues well supplied with interesting communications from E. Hall, Garber, Coleman, Burgess and others. We have room only to call attention to the note in the May No., On *the use of Carbon Bisulphide in the preservation of plants*, from the Bulletin de la Societe Botanique de France. For those who have many plants to be kept free from insects this wholesale agent promises to be a great labor saver.

§ 161. ERRATA.—Although the proof of § 149 was submitted to the author, Capt. J. Donnell Smith's name was misprinted wherever it occurs; also p. 144, l. 1, should read, BRUCHIA DONNELLII; p. 144, l. 13 from the bottom, for "synœcous" read "parœcous".

§ 162. CHANGE OF RESIDENCE OF THE EDITOR.—Our correspondents will please take note that we have removed to 54, East 81st Street, New York, and that Money Orders will be conveniently made on Station K, New York.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 30 *cents Supplement to Directory*, 10 *cents. Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*. 25 *cents. Address*, WM. H. LEGGETT, 54, *East* 81st *Street, New York. Money Orders on Station K, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER, *the President of the Club*, ***may be found at* 245 *Broadway*.**

Vol. VI., No. 31.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, July, 1877.

§ 163. **Separation of sexes in trees.**—Mr. Darwin has called attention to the fact that trees have a strong tendency to bear flowers with separated sexes (*Orig. Spec.*, Chap. IV., *Cross and Self Fert.*, Chap. X.). He finds that about 60 per cent. of the native trees and bushes of Great Britain are diclinous, "an enormous proportion compared with other British plants." From Dr. Hooker it appears that in New Zealand 48 per cent. of the trees and 41 per cent. of the bushes have this character, but only 26½ per cent. of other plants. Dr. Gray's authority is given for the statement that out of 132 trees, native to the United States, 95 or 72 per cent. are more or less diclinous, for the most part decidedly so. As Dr. Gray has evidently limited himself to the taller trees, the 419 "trees which usually attain a height of 16 feet or more" in Dr. Vasey's catalogue were considered from this point of view. It was estimated that 268 or 64 per cent. were more or less diclinous. This result compared with that of Dr. Gray and that of Dr. Hooker shows that the bushes diminish the percentage, or in other words that the higher the trees the more likely they are to be diclinous. In Gray's Manual there are enumerated 2562 flowering plants; of these 493 or 19¼ per cent. may be said to be diclinous. Of trees, shrubs, and woody-climbers which usually attain the height of at least six feet there are 292, and 169 of these, or about 58 per cent., are diclinous. If there were no tendency of woody plants this way there should be only 19¼ per cent., or 56 instead of 169 diclinous. As in this calculation there are included bushes only six feet high, the lower percentage, 58, seems to confirm the rule, that the higher the tree the greater the probability of its sexes being separated.

But it is only a rule subject to exceptions and not a law. The Australian Gum-tree, said to be the tallest of trees, does not appear to be diclinous, and in fact Dr. Hooker says the rule does not hold good in Australia at all. Nor does the converse of the proposition, the more diclinous plants the more trees, hold in reference to the Endogens in Gray's Manual. There are found (in that class) 711 species of the 2562 flowering plants. A simple proportion gives 81 for the number of trees to be expected among Endogens out of the total of 292. But as 205 of the 493 diclinous plants are Endogens, that is about 41½ per cent., and there are 169 diclinous trees in all, about 70 would be the very least number to be expected. In fact there are not 81 nor 70 but only 8 endogenous trees, all diclinous, it is true, but such insignificant representatives of trees as the 8 woody *Smilaces*.

It seems to be now pretty well settled that the pollen is conveyed from the anther to the stigma chiefly through two agencies, the wind and insects. This must be especially the case with diclinous plants. If the flowers are to attract insects, they must do so by putting up a sign that they have honey and pollen to dispose of. The signs which insects read are color and odor. If, on the other hand, fertilization depends upon the wind, there must be an over supply of pollen, and a crowd of recipients with prominent stigmas to secure the continuation of the species, but attractive colors and odors are not needed. Writers on the subject distinguish the former as *entomophilous*, the latter as *anemophilous* plants.

To apply these observations, let the Exogens in Vasey's list of trees and in Gray's Manual be divided into two sections, the second section in each beginning with Oleaceæ. In general the orders in the first section are marked by flowers attractive to insects; in the second, by anemophilous flowers. Vasey has 413 exogenous trees—202 of these precede Oleaceæ, or nearly one-half. But this first section, the section of entomophilous plants, comprises only 60 of the 264 diclinous exogens, the remaining 204 being anemophilous. Of the species in Gray's Manual there are 1593 before Oleaceæ with 51 diclinous trees; the remaining exogens are only 258 with 110 diclinous trees—an enormous disproportion. These 110 diclinous trees are mostly comprised in 8 orders, viz., Oleaceæ, Lauraceæ, Urticaceæ, Juglandaceæ, Cupuliferæ, Betulaceæ, Salicaceæ, Coniferæ. In these orders are found most of our forest trees, with large stigmas, abundant pollen, numerous individuals, social in habit, and rearing their heads to the sky to catch the breezes so necessary for their fertilization.

Whether anemophilous trees have acquired their height and their firm fibre in consequence of their diclinous flowers, or their floral character from their other habits, is a question. Mr. Darwin inclines to the first view. It is not, however, necessary for wind fertilized plants to be tall or woody; all that is needed is that the wind should have a free passage from one to the other, an end which would be equally secured by having the plants social, about the same height and free from interposing strangers, as we may see in the waste places covered with *Ambrosia trifida*, or other species of this anemophilous genus. But a more interesting example is furnished by the prairies covered with grass and the marshy flats with sedges. Reference has before been made to the large proportion of diclinous plants among Endogens, and the small proportion of woody species. The two large orders we are speaking of are mostly wind fertilized, and moreover well adapted to grow where woody plants will not, as Prof. J. D. Whitney has shown in his articles on the prairies in Vol. X. of the *American Naturalist*. They had no need, therefore, to become woody, and no power, in such soils. Their social habits, moreover, secure them to a great degree from other herbaceous rivals.

Mr. Darwin is of opinion that plants were originally diclinous, and that the insect-fertilized trees and shrubs have become monoclinous after the appearance of insects. Perhaps they were outstripped in growth by the others and could only survive by means of other adaptations. In general they are more lowly than the diclinous, though there are some remarkable exceptions—Eucalyptus and some Leguminosæ for example. The Salices present an intermediate stage, for the Willows, which are for the most part low, are visited by insects, while their taller relatives, the Poplars, are wind fertilized. The woody climbers and the mistletoes seem to have preserved their original separate flowers by having at an early epoch availed themselves of the height of their neighbors.

Anemophilous plants are generally biennial or perennial, and also monoecious. The wind is so uncertain an agent, that species which had this two-fold security would be more likely to survive. Very few are annual. Ambrosia, mentioned before, is a remarkable exception, but then the staminate are so arranged in reference to the pistillate flowers that self-fertilization appears to be pretty certain.

W. H. L.

§ 164. **Townsendia.**—Among the many interesting specimens sent by Dr. T. E. Wilcox, U. S. A., collected at Camp Supply, in the Indian Territory, I find the following which seems to be new :

Townsendia Wilcoxiana.—Acaulis ; foliis radicalibus spatulatis acutis hispidulis 1–1½ policaribus; *capitulo* magno, *solitario* (rarius duobus) radicali sessili; invol. bracteis linearibus subacutis subequalibus, disco brevioribus, ciliatis, vix purpureis; radiis flor. masc. uniseriatis purpureis linearibus *planis* erectis, disco duplo longioribus (1′) ; disci flor. fem. tubulatis luteis cum *dentibus* 5 *atro-fuscis ; pappo* in *radio et disco conformi*, setibus ad 30 albis, disci longitudine.

Resembles in habit *T. sericea*, the original species, but differs specifically in the characters italicised above. All my specimens are with but one head, but there are specimens in the herbarium of Columbia College (confounded with those of T. sericea) which show a tendency to form two heads or a double head. A. WOOD.

§ 165. **Borago.**—This is the spelling of the word we find in Linnæus, but of late years the double *r* has come into use. This change appears to have originated among the botanists on the continent of Europe, and to have gradually made its way into England and to this side of the Atlantic. Whatever the origin of the word, it seems to obtain in some form among both the Latin and Germanic nations, among the latter, however, more frequently with one *r*. As the double *r* is now adopted by so many eminent authorities, it seems advisable to abandon the Linnæan spelling, and write Borrago, Borraginaceae, though we shall hardly change the English word Borage. It is curious to notice how little reliance can be placed upon spelling in a quotation. For we find Lindley, for example, quoting Tournefort, in his index, for Borrago, but in his list of genera, Borago.

§ 166. **Lechea.**—In Bentham & Hooker's Genera, at the close of the character of the order *Cistineæ*, occurs the following :

"FORMAE ABNORMES."

"Flores dimorphi, alii apetali oligandri in *Helianthemis* nounullis
" et interdum in Lechea.

"Stamina interdum pauca, imo petalis pauciora in *Lechea* et in
" *Helianthemis* quibusdam."

The two forms of flower in Helianthemum Canadense are well known, and Linnæus himself mistook a form of this Helianthemum for a Lechea, but I do not find any American authority for the statement that Lechea has sometimes dimorphous flowers, and presume that Dunal in the Prodromus is the source from which Bentham and Hooker drew, but have not that work at hand. According to Rafinesque the flowers of Lechea are only open in the middle of the day. I have seldom seen them open, but have examined very many of different species when dried, and have never observed any tendency to dimorphism. The stamens are at least three and the petals never more than three, so that it is difficult to understand the second statement above quoted.

The object of this note is to enquire if any one has met with dimorphous flowers in Lechea, or can account for the statement.

54, East 81st Street, N. Y. W. H. LEGGETT.

§ 167. **Diseased Vaccinium.**—I have been shown a curiosity, in the shape of a monstrous blue-berry, the fruit of Vaccinium vacillans. It was distended to the size of a large cranberry, probably by the growth of a fungus (Exobasium Vaccinii?) which had taken possession of the ovary in its earliest state. All parts of the berry were recognizable—the sepals, and underneath them the stamens—both filaments and anthers preserving their forms, but proportionally distended. The color of the berry was that of the immature fruit, white shaded with pink, and the outside was covered with a white powder which I suppose to be the spores of the fungus.

The specimen seemed to me to be a most curious instance of a struggle going on between two different vital and morphological forces. The form of the berry was well preserved and it did not seem to be the policy of the fungus to destroy its life until its own had been perfected by the production of spores. A. E. B.

§ 168. **Foliation.**—We were so situated this spring as to be unable to pursue this subject, and our correspondents did not fully understand the proposed method. The object in view was to ascertain not the absolute date of the appearance and fall of the leaves, but the *relative* date. For this purpose it is necessary to observe a group of two or more trees or shrubs which have the same situation, soil and exposure as nearly as may be, and to note their several contemporaneous stages of development. Observations of this sort multiplied and the average taken would give with tolerable accuracy the *order* of succession of the appearance and fall of the leaves of our plants. The seasons may be early or late, and vary in different parts of the country. Does the Sugar Maple regularly leaf later than the Red Maple, the English Elm than the American, the Yellow Willow than the Weeping Willow? and how much later? Such are examples of the points to be ascertained.

§ 169. **Botanical Geography of Syria.**—The article under this heading in our last No. was written by Prof. George E. Post, M.D., of Beirut, Syria, who promises to continue his notes. Dr. Post desires southern and western species in exchange for plants of Syria and the adjacent regions.

✓ § 170. ERRATA.—§ 155, for "Duchatre" read "Duchartre"; § 166, l. 11, read "Cryptonemia"; p. 159, ll. 8 and 9, for "on any" read ", or any".

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The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 171. **An Orange within an Orange.**—The editor sent me an orange with the request that, should it be sufficiently unusual, I would give an account of it in the BULLETIN. The orange had been peeled for eating, and upon breaking the carpels apart, to divide it into halves, another and much smaller fruit was found within. This, if not the rarest of phenomena, is certainly an interesting one, and some account of it may be acceptable to the readers of the BULLETIN.

The genus *Citrus* appears to have a remarkable tendency to produce abnormal forms, and probably affords writers on vegetable teratology more illustrations than almost any other. Its leaves, flowers and fruit sport in various ways, and even its seeds sometimes contain several extra embryos. Several of the unusual forms of the fruit in oranges, lemons, citrons, etc. are continued in cultivation, on account of their curious or ornamental character.

What is known as the "Fingered Orange" is an illustration of that deviation from the normal condition called *dialysis*, or the separation of parts that are ordinarily united. In this, the carpels are united below but separated above, and some specimens present the appearance of a hand with its fingers extended. Doct. Maxwell T. Masters (*Vegetable Teratology*, p. 74) figures a specimen in which this separation continues quite to the base, thus making a twin fruit of two nearly equal, somewhat fusiform, parts.

In the "Horned Orange" (and Lemon), perhaps more generally cultivated than any other sport, the abnormal condition is shown in the flower, in which the usual compound ovary is closely surrounded by a ring of supernumerary carpels, which are really transformed filaments. In the developement and maturing of the fruit, these outer carpels become so fused together below as to present a smooth exterior, and they are completely consolidated with the ovary proper, but their upper portions remain distinct and, projecting more or less above the general surface, appear as "horns."

In all these malformed citrus fruits, those parts which are exposed to the air and light, are covered with the usual yellow rind, but where the carpels are surrounded and protected by others, they are destitute of rind. The "Horned Orange" and several other abnormal forms are figured by Risso & Poiteau in "*Histoire Naturelle des Orangers, etc.*," indeed, one who has studied the fine colored plates of that elegant work is prepared for almost any anomaly the genus may present.

The specimen sent by the editor illustrates that abnormal condition termed *pleiotaxy*, an increase in the number of whorls (as distinct from *polyphylly*, a multiplication of the parts in the same whorl), and which is of more frequent occurrence in other parts than here, in the gynaecium. A second set of carpels has been produced within the usual ring of carpels, and as the intruders are surrounded by the normal set, they are without rind, and, being much crowded, are not perfectly regular in shape.

This condition within the orange has occurred two or three times within my knowledge, but according to Moquin Tandon (*Teratologie Vegetale*), it is sufficiently frequent for such oranges to be recognized in the Canaries as a popularly known class, and to be given a distinctive name. In these islands, the oranges containing a smaller one within them, are termed *pregnadoes*, or pregnant fruit, and Ferrari (*Hesperides*) conveys this same idea in calling such fruits *fœtiferes*.

Moquin Tandon states, that three and even four fruits have been found enclosed, one within another, but does not name the kinds of fruit in which these unusual numbers have been noticed.

There is an apple-tree in Pennsylvania, the fruit of which, when cut longitudinally, presents two sets of carpels, or cores, and is popularly known there as the "Two-storied Apple," the extra set being above the other. This case is still different from the editor's orange, or the "Horned Orange." The flower of this apple is apetalous by abortion, and bears upon the calyx tube a set of supernumerary carpels, which stand in place of the petals, and which in the developement of the calyx-tube, to form the mass of the fruit, become involved by and imbedded in it. GEORGE THURBER.

§ 172. **Hypogaeous Fruiting in Callitriche.** — The following communication was sent to me, as editor of the *American Agriculturist*, for publication in that journal. As the observation, which, so so far as I can learn, is for the first time recorded, is of interest to botanists only, I requested the author, Doct. J. P. Joor, of Harrisburg, Texas, to allow me to transfer it to the BULLETIN, as it would here meet the eye of a much larger number of botanical readers.

GEORGE THURBER.

Callitriche Nuttallii, Torr., a very diminutive, prostrate species, is not uncommon in the damp soils of South-Eastern Texas. It hugs the ground at all times very closely, and after a while appears to take root at every joint. The rooting I find, however, to be a mistake. The peduncles, two at each joint, are quite short at flowering time. After the flowers are fertilized, the peduncles lengthen, at the same time turning downwards, until the little nutlets, characteristic of the genus, are forced quite beneath the surface of the moist earth. If collected at this time, the peduncles appear like roots, bearing little tubers at their ends.

Several of the Leguminosae, and some other plants, ripen their fruit under ground, but I have never seen any allusion to the same thing in *Callitriche*. J. F. JOOR, M.D.

§ 173. **The Tamarisk Naturalized.**—Doct. J. F. Joor, Harrisburg, Texas, writes: "On a recent visit to Galveston, I found a Tamarisk, *Tamarix Gallica* (I think), growing on the island in the greatest profusion, along ditches, the borders of ponds, etc., and apparently perfectly naturalized. It is the only arborescent plant that seems to thrive on the island. I do not think it has before been reported as growing wild in the United States."

§ 174. **Obituary.**—Prof. Oran Wilkinson Morris, A.M., recently Librarian of Cooper Union, died on the 9th day of August, 1877, at the house of his son, Dr. Moreau Morris, in East 52d St., New York City.

He was a lineal descendant of Richard Morris, who emigrated to this country from the West of England in company with John Winthrop and was an honored member of the Commonwealth of Massachusetts.

He was born in Ames, Montgomery County, N. Y., where his father was a small farmer, on the 5th day of February, 1798, and at death was 79 years and 6 months of age. His life has been one of many years of usefulness, and his memory will be long cherished by those whom, being dumb, he has taught to speak, and whose minds have been lifted from mental darkness. Thoroughly master of the sign language, he was yet one of the first in this country to advocate and put in practice, literally, "teaching the dumb to speak."

He prepared for college at the Albany Academy, but being compelled by straitened circumstances to abandon this cherished hope, he devoted himself to teaching, in various district schools, "boarding round," until in 1829 he received the appointment of Principal of the "Central Asylum for Deaf and Dumb, located at Bowman's Creek," now called Buel, in Montgomery County, N. Y.

In 1833 this asylum was consolidated by State enactment with the New York Institution for the Deaf and Dumb, at which time he moved with his family to this city and became one of the Professors in that now famous institution. This connection continued until 1869, with the exception of two years spent in Knoxville, Tenn., in organizing the State Institution for the Deaf and Dumb in that city. It will thus be seen that forty years of the most active portion of his life has been devoted to the instruction of that unfortunate class.

Since 1869, at which time his life long partner, whom he married in 1823, died, he held the office of Librarian of Cooper Union, and the many thousands who have visited that great public beneficiary will testify to his untiring zeal, faithfulness and urbanity as an officer and friend.

Notwithstanding the obligations of his occupation as teacher, by his untiring industry, he became a proficient in the sciences of Mineralogy, Conchology, Botany, Astronomy and Meteorology. In Numismatics he was also a devotee. While Curator of the Museum at the Deaf and Dumb Institution he made a rare and valuable collection.

In Meteorology and its phenomena he seemed to take his greatest delight, commencing daily observations more than forty years ago, when recording instruments had not attained their present perfection. Prof. Morris was the meteorological recorder of the Smithsonian Institute, for this city, from its organization to the present time, and he was often called upon by the courts as an expert and reliable observer in determining disputed conditions of weather on certain days in question. Among his papers may be found probably the only reliable records of Meteorology of this locality, dating back fifty years.

Prof. Morris leaves three sons and one daughter, living at the present.

He was an active member of the New York Historical Society, the old Lyceum of Natural History (now the New York Academy of Sciences), the Geographical Society, the American Institute, etc., etc., and of the 23d St. Presbyterian Church.

Prof. Morris was one of the earliest members of the TORREY BOTANICAL CLUB, and contributed to its Catalogue a carefully compiled list of the plants he had for many years noted as growing on this island, either native, naturalized, or generally cultivated. On all his trips and excursions he was wont to gather whatever he thought would interest his associates of the Club. Of late years he has been unable to attend our meetings, but all the older members will affectionately cherish his memory.

§ 175. **Asplenium Filix-femina,** *Var.* **laciniatum,** Moore.*—In the BULLETIN for April, 1876, I mentioned receiving some sterile specimens of a fern that I thought I had succeeded in identifying as the above variety of the Lady-fern. The specimens were found by Miss Eliza Hosmer, in Monmouth Co., New Jersey. The next season, at my request, Mr. Guilford, of Red Bank, N. J., visited the locality and succeeded in finding two plants which he sent to me. These plants have been growing nearly two seasons between other forms of the same species, and I have just succeeded in securing a fertile frond by which I am able to confirm my previous judgment.

The plants are small and very peculiar in their appearance. The fronds are finely laciniate, and uniformly very irregular in outline. The pinnæ are extremely variable in length, some of them terminating abruptly, others being nearly one-sided—but all laciniate—as if from an injury. These peculiarities may be seen even in the young fronds when unrolling.

I am not inclined to recognize the so-called varieties of this protean species as we find them growing with us, but this form certainly has a better claim to be considered a variety than any with which I am acquainted. GEO. E. DAVENPORT.

BOSTON, Aug. 6, 1877.

§ 176. **Publications.**—1. *American Journal of Science and Arts*, July and August: Habenaria (Platanthera) rotundifolia, proves to be a true Orchis, having a pouch to the pollinia disks, and Pursh's name, O. rotundifolia, is the proper one. Has any one yet observed whether our H. viridis has its glands protected by pouches? Prof. Farlow gives interesting cryptogamic notes, particularly on Stahl's study of the Lichens. Dr. Gray has an interesting article on the extraordinary petioles of the cotyledons in *Megarrhiza Californica*, Torr. On germinating some fresh seeds, Dr. Gray found that the body of the seed in its shell was raised well out of the soil upon what seemed a well developed radicle, but the cotyledons never expanded. After the lapse of about a fortnight the plumule came separately out of the soil. The plumule had come forth from the base of what appeared to be an elongated radicle (of two or three inches in length), and below this the thickening of the root, which acquires enormous dimensions in old plants, had already commenced. A large amount of the nourishing matter stored in the cotyledons had been carried down to the root and used in its growth as well as in that of the plumule. The latter came from a cleft at the very base of the seeming radicle, which otherwise appeared to be solid. But on cutting it across toward the base it was found to be tubular, and when beginning to wither this stalk was separable from above downward into two. This, therefore, is a case in which long peticles to the cotyledons, of which there is no appearance in the seed, connate into one body, are developed and greatly lengthened in place of the radicle, which is thus simulated. Something similar occurs in Delphinium nudicaule, T. & G., Horse-chestnut, and Ipomœa leptophylla. Botanists on the Pacific coast are earnestly requested to examine the germination of all the species of Megarrhiza. Mature fruits and seeds of all the species are much desired. Athamanta Chinensis, L. (probably Conioselinum Canadense, T. & G.), would seem, from a letter of Muhlenberg's in the Collins' correspondence, to have possibly got its specific name from a misspelling or mistake of name of the original locality, Genessee. Linnæus says "Chinensem dixit Barthram." Was it Kalm who labelled his plants from Kentucky, *Gentogi?*—2. *The Botanical Gazette* is always full of good things. In the July No. we particularly note, Prof. Porter on variations in Podophyllum peltatum, L., Mr. Shriver on Nepeta Glechoma, Benth., and, in the August No., Dr. Engelmann on the varying periods of the opening of pine cones.—3. *The American Naturalist*, with the Botany under the conduct of Prof. Goodale, becomes of increasing interest. We are rather late in calling attention to Mr. Watson's request for a more careful examination of our species of Iris. Specimens of flowers, fruit, and roots, fresh or dried, from any part of the country, may be sent to the Botanic Garden, Cambridge.—4. *Field and Forest*, July, begins the Third Vol. with an interesting account of a botanical trip to the Dismal Swamp and parts adjacent.—5. *Psyche* to June has been received. This little periodical is indispensable to entomologists, and it is desirable that every botanist should be more or less an entomologist.—6. *Proceedings of the Acad. of Nat. Sciences of Philadelphia*, Jan. to March, 1877: Of much botanical interest is Mr. Isaac Burk's list of 125 plants, recently collected on ships' ballast in the neighborhood of Philadelphia.—7. *Descriptions of new species of plants, with revisions of Lychnis, Eriogonum, and Chorizanthe*, Contrib. to Am. Botany, No. VII., by Sereno Watson, Proceed. Am. Acad. Sci., Vol. XII., pp. 246–278: We notice an error in the imprint, 1876 for 1877. It seems that we have eleven American species of Lychnis. Dr. Allen found years since at the White Sulphur Springs of Virginia an Eriogonum, which notwithstanding its yellow flowers Dr. Torrey thought to be E. tomentosum. We think this was before he and Dr. Gray made their revision of that genus. At all events the northern locality does not seem to be recorded.—8. We are glad to notice that Mr. Cassino, of the Naturalists' Agency, proposes to publish *Illustrations of the Ferns of North America*, Text by Prof. Eaton, Illustrations by Jas. H. Emerton. The work will be issued in large quarto parts, at intervals of about three months, three colored plates to a part (chromo-lithography), at one dollar a part. With such an artist as Mr. Emerton, and such a master of pteridology as Prof. Eaton, and such able aids as Messrs. Davenport, Robinson, Faxon, and Mrs. Cooper, and with the Herbaria of Yale, Cambridge and Boston, nothing better could be desired. The paper is promised to be the best in the market. The price is remarkably low.—9. *The Chautauqua Flora*, by Edward S. Burgess, Clinton, N. Y: This includes the cryptogams to the end of Hepaticæ. There are 37 lithographed pages, 880 species. Mr. Burgess deserves credit for his enterprise. We notice that he gives no Cistaceæ. We wish much that those who have knowledge of this order would help us in fixing the limits of the species on this side of the Rocky Mountains. Mr. Burgess reports a pink-white variety of Pontederia, found by Mr. Geo. Miner. There seem to be no Cassias in Chautauqua, 49 Carices, and 30 Ferns.—10. *Hay Fever or Pollen Poisoning :* In this essay, reprinted from the Transactions of the Medical Society of New Jersey, Newark, 1877, Dr. Elias J. Marsh, of Paterson, seeks to maintain, as others have done before, that the rose and hay fever, the former in early, the latter in late summer, are caused by pollen floating in the air; in particular the hay fever by the pollen of Ambrosia. It would seem likely enough that susceptible constitutions may be irritated by such agencies, especially as certain regions, sharply marked, are found to be free from the exciting cause, but more accurate observations are needed. We notice one or two botanical misprints. Ambrosia trifolia should be A. trifida. How did the Dr. recognize the pollen of Ambrosia in the air? It is apparently an anemophilous plant, and very probably the pollen is peculiar, and, if certainly identified, the observations would be interesting on that account.—11. *Science Observer*, No. 2, Boston, Mass., Boston Amateur Scientific Society, 4 pages monthly, 25 cents per annum. Solicits exchanges. The present No. is chiefly Astronomical and Mineralogical.

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* Described and figured in Moore's "Nature Printed Ferns," Vol II., p. 41, Pl. lix.-A; also in Lowe's "New and Rare Ferns," p. 130, Pl. lv.-B.

§ 177. **Pontederia cordata,** L.—On page 62 of this volume of the BULLETIN, I gave some observations on this plant, but working with dried specimens, I did not make out its character truly and supposed the lengthening of the style in the coiled up flowers to be a result of growth or tension. There is I believe such an extension, but not to the degree supposed.

This summer, I had the opportunity of seeing some growing plants, and find that Pontederia is as truly trimorphic as Lythrum Salicaria, or even more so. There are three kinds of flowers, not on the same but on different plants. Of these, one has the stigma raised on the style to the top of the flower, a second only to the middle of the flower or top of the tube, and the third with a very short style at the bottom of the tube. There are thus three positions for the stigma. Whenever the stigma is in one of these positions, the two other are occupied respectively by one of the two sets of anthers, three in a set. When the anthers occupy the highest position their pollen is, I judge about 1⅔ thousandths of an inch in diameter. Anthers occupying the middle position have pollen rather smaller, say 1⅓ thousandths of an inch in diameter. When at the bottom of the tube, the anthers have still smaller pollen, say 1 thousandth of an inch or less. The pollen in all positions seems to be perfect. It remains to be seen whether all forms ripen seed equally. The stigma of the tallest style is plainly cut into six linear segments. If there is any division of the other stigmas, it is not very manifest. The stamens of each set are not quite uniform in length, and in the short styled form, in the bud, the lower set is approximate to the upper. This is the one from which the figure in Maout and Decaisne seems to have been taken. The second form is that which Dr. Torrey describes in his Flora of N. Y., and Dr Gray in his Manual, except that the latter makes no mention of the style. Nuttall notices the variation in the length of the style, which he says is "usually about its [the corolla's], length, shortest when the stamina are most exserted." Elliott describes the first form. From the illustration of Eichhornia speciosa, in Lindley's Vegetable Kingdom, we should suspect it also of being heteromorphic.

There are many questions about Pontederia that still require to be answered, and we earnestly request those who live in its neighborhood to examine into them. What insects visit it? There are probably three kinds at least, suited to carry off the three forms of pollen to their appropriate stigmas. What do the insects seek, or where is the honey? Do all the forms ripen seed equally? What is the use of the curious glands that beset the flowering parts?

W. H. L.

§ 178. **Cassia.**—The three kinds of Cassia that are native hereabouts need to be studied in reference to their fertilization. Dr. Torrey seems to be the only writer who refers to the fact that the anther of *C. nictitans*, L., though opening at first with pore-like slits, finally splits down the whole length. But the other two here open only by pores, and I have experimented in vain to find how the abundant pollen is discharged. They are both freely visited by a large bumble bee.

W. H. L.

§ 179. **Lythrum Salicaria,** L., is well established on the Northern R. R. of New Jersey, near Granton.

§ 180. **Symplocos and Alnus.**—Can any of your readers give the size which Symplocos tinctoria attains? During a recent botanical excursion in Southern-Delaware a specimen was found which was thirty-five feet in height, the trunk of which at the base was 28 inches, and, 3 feet from the ground, 23 inches in circumference. I have never seen this tree attain such a size even in the Southern States.

On the same trip a specimen of Alnus maritima was measured as follows: height 23 feet, circmmference of trunk at base 16¾ inches. These were measured by Mr. Albert Commons and

WM. M. CANBY.

§ 181. **Suffolk County Plants.**—I recently had the good fortune to discover *Zannichellia palustris*, L., in a stream leading into a creek near the Sound. Also the following plants: *Lathyrus palustris*, L., at Wading River; *Spergularia rubra*, Presl., var. *campestris*, Gray, *Myosotis verna*, Nutt., and the white variety of Silene Pennsylvanica, Mx., at East Hampton; *Asclepias incarnata*, L., at Long Pond, Wading River (the variety *pulchra* is very common here); *Potamogeton Oakesianus*, Robbins, at Manorville, Wading River, and Riverhead.

The ponds on the cliffs at Northville were so dried up, that no *Hottonia inflata*, Ell., could be found, but while looking for this I discovered a large quantity of *Onopordon acanthium*, L., at a wood landing. The seeds were probably brought in ashes from Canada, as there were several heaps there at that time, and it came up around where ashes had been laid. Since writing the above I find Mr. Young has reported it from Northville; from his description I suppose it is the same locality.

While collecting Woodwardias recently, I found the dried swamp full of *Elodes Virginica*, Nutt. The humble-bees were at work on the flowers in such numbers, as to compel me to give up the idea of getting any. *Woodwardia Virginica*, Smith, had mature fruit. The fruit of *W. angustifolia*, Smith, was still very young.

I have been much interested in watching the humming birds in my garden. There are about two hundred spikes of Gladiolus in flower; there are always one or more birds on these, and once I counted six, all with the dark throat. I have never seen any with the red throat. They are quite tame, flying all around and alighting within three feet of me. I have never seen them visit any other flowers, except fuchias, and Gilia coronopifolia, Pers. The gladiolus must be very rich in honey, though it is not fragrant. Is honey produced as long as the flower lasts? I should judge so from the fact that the birds are about them constantly.

The beach-plum bushes (Prunus maritima, Wang.), have suffered severely from the ravages of a slug, similar to the rose slug, but nearly black in color and about half an inch in length. They have completely skeletonized the leaves, and, in most cases, taken every leaf. For nearly a half mile on the beach bank, the bushes look from a distance as if a fire had passed over them. The bushes are just putting out new leaves. Isolated specimens and those on the upland do not seem to be attacked. It is to be hoped they will not stay from year to year, as the plums are much used by the residents along the shores.

A friend told me that if the peduncle of the Hoya carnosa, or Wax-plant, was not cut off, after the individual flowers withered and dropped, a new cluster of flowers would grow from the same place. Having a plant flowering this summer I tried the experiment, and now have the second cluster on one peduncle. Three others appear as the first did, so I have hopes of eight clusters instead of four.

One day last summer, while on the Sound shore, I saw a fine illustration of the manner in which plants are distributed. The wind was north and blowing very hard. Very often a seed (of some thistle I supposed) would blow past me. I tried to get some, but did not succeed. We are opposite New Haven, and the Sound is about twenty miles wide. I have often heard that the Canada thistle was introduced on Long Island in this way.

August 15, 1877. ELIHU S. MILLER.

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§ 182. **Callitriche Nutallii,** Torr.—In the last No. of the Bulletin was a note from Dr. Joor on the hypogeous fruit of this species. On reading this Dr. Engelmann wrote to Dr. Thurber, calling attention to the fact that the same peculiarity had been observed by Prof. Wm. M. Carpenter, of Jackson, La., as recorded in a memorandum in the Torrey Herbarium. On consulting the Herbarium we found the note referred to under a specimen labelled, *C. pedunculosa*, Nutt. The peculiarity is thus described :

"Callitriche— * * * The flower axillary, the germ sessile at first but afterwards peduncled; the peduncles turning downward and ☞ the reniform fruit buried beneath the surface in the same manner as the Arachis hypogea.

"It grows in little patches as the terrestris, which it differs from in the circumstance of burying the fruit, and somewhat in the form of the fruit.

"It roots at the lower joints and, being also attached to the ground by the elongated peduncles, it is very hard to detach it from the soil."

The date of this note Mr. Le Roy thinks is somewhere about 1830.

§ 183. **Notes from Rhode Island.**—My friend, Mr. Thomas Battey, of this city, informs me that in a large number of flowers of *Impatiens fulva*, Nutt., which he has examined, he has found the sacs all perforated by humble-bees. He has watched these bees about the flowers. You may remember that Dr. Gray says this is only likely to happen in a profusely flowering species.

One of my summer class has seen a bee enter the corolla of *Gentiana Andrewsii*, Griseb., and remain hidden within for some time. I suspect there is a very pretty cross fertilization in this flower, but I doubt if bees are the agents. Where the expanded and flattened filaments unite with the corolla very neat little nectaries are formed, much like those figured in *Nature* by Müller for some alpine species. The extrorse anthers point in the direction of cross fertilization. W. W. Bailey.

Providence, R. I.

§ 184. Is *Ailanthus glandulosus* monœcious?—This tree has of late years very much disappeared from the sidewalks of our streets, where it was formerly planted to a large extent on account of the abundance of shade furnished by its dense foliage. Most of the trees that were planted proved to be staminate, it being rare to find one bearing the curiously shaped samara. Last Spring when the trees were in bloom I examined a large number in this city, all of which bore staminate flowers. A few days ago I noticed there had grown from the trunk of one of the trees from which I had gathered specimens, and at some distance below the main branches or limbs, a smaller branch, of this season's growth, and it had borne a panicle of fruit, the samaras though not numerous being of full size. I am satisfied this tree could not have borne any fruit in former years, and now, having looked at a number of others that I examined when in blossom last Spring, I have not succeeded in finding another one with fruit on. Isaac C. Martindale.

Camden, N. J., *Aug.* 30, 1877.

§ 185. **Cleistogene—Flowers**—*The cleistogene flowers* of Viola cucullata are greatly deformed and yet very efficient. Their every ovule is impregnated, and their capsule full of seeds. The flower is closely inflected on its stalk, conical in shape, having only its pale green calyx to cover it, which it does closely, never opening until forced open by the growth of its ovary. The anthers are in close contact with the stigma and open towards it, discharging on it *all* their pollen : at least, while the pollen is plainly seen under the stigma suspended by its tubes, I could find none in the anther cells.

The average number of seeds in these capsules is 60, and the grains of pollen in each anther are certainly few, if any, more than 12. Here then is the economy of cleistogene flowers. They dispense with nectar, with superfluous pollen, and with the flaunting corolla, and yet, by husbanding all their pollen, secure a better crop even than the open vernal flowers.

Are the flowers of *Gentiana Andrewsii* properly cleistogene? They afford now an interesting study in connection with the question of insect agencies in fertilization. On the 19th of September I examined numerous specimens in all stages of advancement. In every flower *save one* the corolla was completely and *doubly* closed, as usual, by the interpetalary appendages in contorted folds, which are again covered by the true petals. The appendages are 2-lobed and in our specimens not at all fringed, as sometimes described. The 5 anthers, slightly cohering, closely encircle the short style just beneath and in actual contact with the 2 recoiled stigmas. After impregnation, the stigmas, by the growing ovary, are carried far above the anthers.

In every flower whose anthers were open pollen was found on the stigmas, but not scattered on other parts ; all that was not on the stigmas apparently remained yet in the anthers. This was the case even with that flower whose corolla was open by a small round aperture.

The grains are very small—four times smaller than those of the Morning-Glory. I estimated their number to be about 400 in each anther—2,000 in the 5 anthers. I also estimated the number of ovules in the ovary and seeds in the capsule, and found them to be 1000 (in some a little more, in others a little less.)

Nectar abounds in this as in other flowers, secreted in the depths of the corolla tube.

From these observations I infer that the flowers of the closed Gentian are properly *cleistogene ;* that insects have little or nothing to do in their fertilization. Of the 50 flowers examined both at night and morning, only one was opened (as if by an accident). None showed signs of disturbance of pollen previous to impregnation. In some of the half-grown capsules worms were found, having eaten their way in. The plant is doubtless completely self-fertilized. The nectar goes untasted, serving some other purpose than a bait for bees. The pollen is not wasted, and there is none or little to spare, being only 2 grains to each ovule. [G. Ward.]

§ 186. **Cereus serpentinus,** Lag.—A few days ago I was much surprised to see one of my night-flowering Cerei, perfect its bloom in the early hours of the day, Sept. 3d, instead of late in the evening, as is the habit of this plant. *Cereus serpentinus* (Lagasca), or Serpent-like Cereus, had been kept out of doors since August 10th. Previous to that time it stood under glass, where its buds were set. On the night of the 24th three buds opened simultaneously; another bloomed in the evening of the second day afterwards, and another still shed radiance between the hours of 8 and 12 P.M., of August 22d.

The temperature of Sunday, Sept. 2d, was decidedly autumnlike, being the first cool weather of the season. At 6 P.M. of that day the bud looked as if it might expand on the following evening. It had not yet the plump appearance of a mature bud. During the night it blew up cold, the thermometer at midnight indicated 63°; at 7 A. M. of the following day it stood at 60°, and it is fair to suppose that at 3 o'clock A. M., the time of expansion of this wonderful bud, the mercury indicated about 55 degrees Farenheit. While the temperature of August 29th, at 3 P.M., indicated 90°, that of September 2d, at the same hour, was only 75°. To this sudden decrease of temperature may be due the fact that the natural development of the bud was much delayed, in fact arrested, by a cold wave, so that the flower, which, all conditions being equal, should have opened on the evening of the 2d, did not expand until about 3 o'clock the following morning.

From 6.30 to 8.30 A.M., the flower, which was nearly all white, seemed to be at its zenith of beauty. I had the plant photographed at 9 o'clock. It commenced to contract about 10 A.M., and by 12 o'clock it was almost closed. The time of inflorescence of this species certainly does not last more than 8 or 9 hours. Having repeatedly taken notes of its period of flowering, I know it to be so. *Anthesis* or the opening of the bud is perfected in about an hour's time.

There is a well defined periodicity in the flowering of all plants. In this case it was exceptional, the thermometrical variation producing a decided change in the development of the flower-bud.

606 3d AVE., *Sept. 7th.* R. E. KUNZÉ, M.D.

§ 187. **Florida Ferns.**—During the first two weeks in May, accompanied by two or three friends, I went on a botanizing expedition in a cart. This two-wheeled Florida cart proved to be a very convenient vehicle in going into difficult roads and hard places. Our destination was the Halifax River, the "Settlements," Daytona and Port Orange, about 60 or 70 miles south of St. Augustine. I found *Polypodium Plumula*, Willd., growing equally well on decaying, prostrate logs, and in the ground on the bank of a constant brook at Daytona, and once on the trunk of a living tree, a foot or two above the base. This last was a fine, large specimen, well fruited. The fern was most plentiful by the side of the brook. I had never before had fruited specimens of it, except one frond that seeded in my fernery. I had collected the fern about fourteen miles west of St. Augustine, in deep woods, where it grew upon two or three inclined Live-Oak trees, climbing the trunks as *P. incanum* does, and, like it, curled up tight in dry weather. The specimens that I saw there were not more than eight or ten inches high, and the pinnae very narrow, the whole frond very delicate and extremely sensitive to a dry atmosphere, I might almost say, to the touch. After picking my fernery specimen, I was obliged to *run* with it up stairs to put it immediately in press, as the tips of the pinnae had already begun to roll inward toward the rachis. In this St. Augustine locality I searched vainly for fruit. When I first gathered the Halifax River specimens, I could not believe it to be the same fern, until a careful study of the description in Chapman, and comparison of venation, shape of frond, etc., of the two plants, convinced me that the two were of the same species. The Halifax specimens were larger every way—usually a foot or eighteen inches long—much more vigorous, firmer in texture, and much less sensitive. In the fernery the two plants seem to preserve their difference in appearance. I was also made happy by finding, under the direction of Mr. Chamberlin, the beautiful *Adiantum Capillus-Veneris*, L., growing in rich hummock-land where wild oranges and other trees made a constant shade. Little mounds or depressions were the haunts of my charmer. Last year's fronds were all gone, or rather the pinnae had dropped, leaving the shining black, wiry stems standing upright, and spreading out their slim fingers, while the baby fronds were coming up around them. Some were old enough to be well fruited, while others were very tender, and of a lovely pink color. A fine cluster of the *Epidendrum venosum*, Lindl., looked down upon us from their proud height, about eighteen feet above ground, upon the smooth trunk of a *Magnolia grandiflora*. After a hard climb, my brother succeeded in poking off the small onion-like bulbs, and the prize was ours. *E. conopseum*, Ait., is quite common around St. Augustine, but I have never found E. venosum there. Other air-plants—*Tillandsia recurvata* probably—formed pretty grey rosettes on the trees. Young tender fronds of *Polypodium aureum*, L., graced the numberless Palmetto trees, but Jack Frost had destroyed all the old fronds, and on these new-comers the fruit-dots were still pure white, and too young to be collected. The firm, brown, shining stems, and chaff-covered rootstocks of this fern are very interesting. Fruit-dots were beginning to appear upon *Aspidium patens*, Swartz, and *A. Floridanum*, Chap. The long line-wide fronds of *Vittaria lineata*, Swartz, were always ready to be gathered, while the fruit of *Osmunda regalis* and *O. cinnamomea*, which grow finely here, was already gone. *Acrostichum aureum*, L., the only fern with which I am acquainted which loves salt water, was sending up its great fresh fronds. It grows in creeks and inlets from the sea, with its rootstocks in the salt water, and is perhaps almost an aquatic plant. The most northerly limit of which I know is twenty miles south of St. Augustine.

MARY C. REYNOLDS.

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§ 188. **Botrychium Lunaria in New York State.**—In June, 1872, Miss Jane Hosmer found by the Jamesville Road, near Syracuse, a very peculiar Botrychium, which, on account of its anomalous character and the absence of necessary data, I was unable for a long time to place satisfactorily.

Recently, through specimens collected by others in the same vicinity, I have become convinced that it is an extreme form of *B. Lunaria*, Swz., and, as such, it is a most interesting and remarkable specimen.

The whole plant is about 7′ in length, and separates near the middle into a fertile, and stalked sterile frond. The sterile frond is 3′, 8″ in length by only 5″ in breadth, narrowing only very slightly toward the apex, and is composed of small, alternate and distant, semilunate, or merely rounded, fleshy segments; its stalk is about 6″ in length. The fertile frond is similarly elongated to about the same length. The whole specimen has the appearance of having been *drawn out*, probably being an instance of non-development.

The specimen will be figured in a forthcoming paper on B. simplex, but, as I now regard it as a form of B. Lunaria, I think it only right that Miss Hosmer should have the credit of having first found this rare fern within the limits of New York State.

In 1873 Mr. E. W. Munday collected specimens of a more decided lunaria-like character, and in 1876 Mrs. Stiles M. Rust collected a number of specimens from the same locality, some of which exhibit the same anomalous characters as Miss Hosmer's specimen, but are less drawn out.

During the present season of 1877, Mrs. Rust has again collected it, and has kindly furnished me with a fine series of specimens, with living plants, and I have been able to connect them directly with *B. Lunaria*, Swz.

The specimens differ from the ordinary European and the Lake Superior forms in the stalked sterile frond, and the more distant, cuneate or less decided lunate forms of the segments.

Milde, in his admirable monagraph on the genus, mentions similar forms, and in his description of this species, says, that the sterile frond is sometimes stalked, even to the extent of 8″, and that the segments are sometimes distant, cuneate, or merely rounded in form.

The species is so rare in the United States that any discovery of it is worthy of notice.

It has only been found heretofore (so far as I know) on Isle Royale, in Lake Superior (Herb. University of Michigan, 1869; Henry Gillman, 1873).

I have seen it credited to the Rocky Mountains, but do not know of any specimens within our limits; but the Flora of New York State may now be credited with this rare fern, which gives to it every American Botrychium but one, *i. e.*, *B. boreale*, Milde. Who will find that? GEO. E. DAVENPORT.

BOSTON, August, 1877.

§ 189. **Staten Island Plants.**—There is a patch of *Euphorbia Lathyris*, L., a short distance from New Dorp, on the Richmond Road. I have noticed it for two years, and it seems to be established.

Ludwigia sphaerocarpa, Ell., grows abundantly in several swamps near New Dorp; *Stachys hyssopifolia*, Michx., occurs in small quantities around the same places. I find *Caulophyllum thalictroides*, Michx., and *Sanguinaria Canadensis*, L., in woods near Egbertville; *Tipularia discolor*, Nutt., grows near there also. There are a number of trees of *Diospyros Virginiana*, L., between Court House and New Dorp, a short distance above the railroad. *Melitotus officinalis*, Willd., grows a short distance down New Dorp Lane, and *Chenopodium glaucum*, L., near the beach, on the same road. *Lechea thymifolia*, Pursh, occurs on the beach, near Garretsons. I have found both *Lathyrus palustris*, L., and the var. *myrtifolius*, Gray, in swamps along the salt meadows near New Dorp. *Hibiscus Trionum*, L., grew this year in a field near Court House. *Parnassia Caroliniana*, L., grows in a swamp near Silver Lake; near by is *Castilleia coccinea*, Spreng. The yellow-bracted variety grew there last year sparingly. *Pedicularis lanceolata*, Michx., occurs there also. I found this spring two plants of *Trientalis Americana*, Pursh, near Giffords. *Stylosanthes elatoir*, Swartz, grows in a cedar woods near Richmond. I noticed this summer, while walking along the meadows near Giffords, half a dozen plants of *Verbena hastata*, L., which, instead of having blue flowers, had them pure white; they grew in company with large quantities of the blue. Mr. Hollick found *Asclepias incarnata*, L., changed in the same manner. We found a specimen of *Vernonia Noveboracensis*, L., on the same sport. Mr. Hollick found *Hottonia inflata*, Ell., in a pond near Mariners' Harbor. *Asarum Canadense*, L., grows in several places near the same place. *Woodwardia angustifolia*, Smith, grows on the shore of Silver Lake. The sterile frond of this singular fern may readily be taken for Onoclea sensibilis, L. I found *Nicotiana rustica*, L., and *Martynia proboscidea*, Glox., growing as weeds in a garden at Concord. *Crataegus Crus-galli*, L., occurs along a brook near New Dorp. *Heracleum lanatum*, Michx., is plenty on the same brook, further down. *Thymus Serpyllum*, L., occurs on the Turnpike, near the Clove Road. *Pinus mitis*, Mchx., occurs near Giffords' Station, S. R. R. *Hieracium aurantiacum*, L., is an escape in the same vicinity.

One day in the latter part of May last, while botanizing on the sea beach below Giffords, I collected several plants of Opuntia vulgaris, Mill. [?], each having several buds. I took them home and laid them aside, hoping that they would open; my hopes were realized, for during June they all expanded, each plant opening one flower a day, and the blossom of one day withering on the next. While carrying one of these plants from one room to the next, it accidentally fell from my hand. When I picked it up, I noticed that the stamens, which before the fall were expanded so as nearly to touch the perianth with their anthers, were now closely packed around the pistil, the anthers pressing against the stigmas. As soon as another flower opened, I gave it a rude shock and found a like result. All of my flowers showed a similar contraction. When the plant was allowed to remain quiet for a few minutes the stamens would again expand to their normal position. I found that a slight tap was sufficient to cause the contraction. This phenomena would seem to have some connection with the fertilization of the pistil. I should like to know whether any other species of Opuntia, or, indeed, of any of the Cactaceae, have a like sensibility.

I found this afternoon a twig of *Solidago lanceolata*, L., which presents the *decided* peculiarity (to me) of being decidedly glaucous. It grew with large quantities of the common S. lanceolata and S. tenuifolia along the salt meadows near New Dorp. [The leaves are beset with resin-like spots, not truly glaucous, nor, as Mr. Peck informs us, due to fungoidal growth.—Eds.] N. L. Britton.

New Dorp, Sept. 17th.

§ 190. **Gentiana Andrewsii,** Griseb.—It is curious to see a flower with so conspicuous and high-colored corolla as that of Gentiana Andrewsii ranked as probably cleistogamous. Here the corolla opens, like other Gentians, in bright sunshine, although only for a short time. Here, too, humble bees are seen to force their way into the closed flowers in the manner described by W. W. Bailey. The flowers last for a rather long while; the extrorse anthers open and expose the pollen long before the stigmas are ready; when these become exserted by the further growth of the ovary, they at first separate moderately, exposing the receptive surface to an entering bee, but not to the pollen below: at length they diverge widely, become revolute, and not / in doing so they ~~but~~ rarely bring the stigmatic surface into direct contact with the pollen below,—thus securing self-fertilization when it may no better be. This is the upshot of my observations a year ago in the Botanic Garden here. A. Gray.

Cambridge, Oct. 15th.

§ 191. **Pollen of different sizes.**—In noting the unequal size of the pollen grains of the trimorphic flowers of Pontederia cordata, I had forgotten that Darwin had, in 1864, pointed out the difference in color and size of pollen grains of the different kinds of stamens in Lythrum. The statement, therefore, that Pontederia was perhaps even more curiously trimorphic than Lythrum, was hasty. In fact, as Dr. Koehler points out to me, dimorphic as well as trimorphic flowers are known to bear pollen grains varying in size to suit the adaptations of the flowers. W. H. L.

§ 192. **Viola cucullata.**—Explanation of the economy of the cleistogamous flowers of this plant in the last Bulletin were read on occasion of the exhibition at the Club of very fine specimens. As printed, without this statement, they seem to be offered as a novelty, to which, of course, they have no claim.

§ 193. **Alpine Plants.**—Mr. C. G. Pringle, of Charlotte, Vt., offers for exchange or sale a few sets of the Alpine Plants of New England, the fruit of his extensive herborizing during the past summer in the White and Green Mountains. Mr. Pringle's collections contain *Gentiana Amarella var. acuta* (*American Naturalist*, Vol. II., page 620), *Anemone multifida*, *Astragalus Robbinsii*, *Gnaphalium supinum*, *Orchis rotundifolia*, *Danthonia compressa*, and all, or nearly all, the other rare plants of his region.

§ 194. **Florida Plants.**—Miss M. C. Reynolds, St. Augustine, Fla., has sets of plants for sale Mr. Le Roy, Columbia College, N. Y., has some of these on hand.

§ 195. **Publications.**—1. *The Myxomycetes of Great Britain, arranged according to the method of Rostafinski*, by M. C. Cooke, London, 1877. *The Myxomycetes of the United States*, by M. C. Cooke, from the Proceedings of the New York Academy of Science, 1877. Fungologists will be interested in this account of the Polish naturalists' monograph, and in its application to American species, some of which will have to be re-examined and more particularly described, in order to find their place in the new system.—2. *Catalogus Plantarum in Nova Cæsarea repertarum*, by O. R. Willis, New York and Chicago, A. S. Barnes & Co. This new edition is much fuller than the first, and is, no doubt, a pretty complete enumeration of New Jersey plants. It is introduced by some useful suggestions to young collectors. In a future edition some of the plants put down as limited will probably have a wider range assigned to them and vice versa, and some localities, isolated or reported on old authorities, will have to be looked up. It was not to be expected that the catalogue of so rich a botanical region would be free from many imperfections in its early stages. We notice some as we turn over the pages. The interesting discovery of Clitoria Mariana at Little Snake Hill has been overlooked. Lespedeza Stuveii, Nutt., a rare or even doubtful species, is said to be common in Monmouth Co. In putting down Helianthus tuberosus as a Brazilian plant, Mr. Willis has ignored the recent discussion of that subject. Polymnia Canadensis is credited to Weehawken, a mistake long since pointed out in the BULLETIN.—3. The *American Journal*, Nov., has a short article on ring growth in Exogens, by Charles B. Waring. Mr. Willis, to whom Mr. Waring refers, has repeatedly brought this interesting subject before the CLUB. Prof. Farlow now thinks that the onion-smut, *Urocystis Cepulæ*, Frost, is the same as *U. magica*, found in Italy.—4. *Field and Forest*, September, contains an account of the flora of Roan Mountain, N. C., and how to get there, by J. W. Chickering, Jr. The writer evidently does not believe in *Shortia*, and so did not find it.

§ 196. **New edition of the Botanical Directory.**—We purpose issuing, early in December, a new edition of the Directory, and hope to include in it lists of the more important Herbaria, Libraries, Botanical Gardens, Botanical Societies and Journals of America. As the utility of such a publication depends greatly upon its completeness, we urge all devotees of the fair science to aid us in eliminating errors in the old edition, and in adding to the completeness of the new. We cannot hope for fair success without such co-operation. As this is a labor of love only, and for the common weal, we hope that our appeal will meet with hearty response. We need, more particularly, fuller information about botany in the South and beyond the Mississippi, and also in the West Indies. Address Wm. H. Leggett, 54, E. 81st St., New York.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory 30 cents Supplement to Directory, 10 cents. Vols. I.-V., with index, and* ***photograph of Dr. Torrey, $3.75. Copies of Constitution and By-Laws of the Club***, *25 cents. Address,* WM. H. LEGGETT, *54, East 81st Street, New York. Money Orders on Station K, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at 245 Broadway.*

§ 197. Fresh Water Algae. III.

In offering the following list of Fresh Water Algae I present the work of the past twelve months. It embraces upward of 150 forms new to the United States and 24 more entirely new species. The former possess features more or less marked, which readily reconcile them with the diagnosis of European plants. I will not say, I consider all of them distinct species. The more I see, the clearer my conviction that there are many forms accepted as species, which are merely varieties of development of the same plants. For the present, I not only accept these, but have gone so far as to add 24 more to the already very large number described by European authorities. The most of these new species are very distinct; for two I found no congeners: the one I call *Kalodictyon*, the ornamented net, being a net-like growth, with the threads strung with forms as of wrought pearl: the other I have named *Poterophora*, urn bearer, in view of the urn-like forms borne upon the filaments. Doubts have been expressed, whether this is a normal form of an Alga. The idea of a protothallus of a moss has been suggested, but it is unlike anything of the kind described, moreover, the urn forms put forth gemmae from the open ends; these are at first spherical, then they divide by a transverse membrane, elongate, and add cell to cell, reproducing filaments like the mother plant.

The larger portion of the plants enumerated were collected in Northampton and adjoining counties of Pennsylvania; others are credited to other localities. I acknowledge gratifying aid received in collections made by H. W. Ravenel in South Carolina, by J. Donnell Smith in Florida, by T. S. Brandegee in Colorado, by C. L. Anderson in California, and by others. C. F. Austin, of New Jersey, in his indefatigable bryological researches during the past ten years, laid by many specimens not belonging to his special departments; these he presented for examination. Among them were found a number of very interesting plants, new to this country. One from the White Mountains is worthy of a special note. It is a plant of some popular fame in the Alpine regions of Europe, known as the "Veilchen Stein" or as "Veilchen Moos" (Violet Stone, or Violet Moss). It forms a thin stratum on stones, which when dry is inodorous, but when moistened emits the delightful fragrance of violets. In the list below it appears as Chroolepus iolithus.

I add a couple to the list that are not quite new; plants that were discovered by Bailey about 25 years ago, but have not been noticed since.

The occasional initials in brackets indicate the collector's name.

BETHLEHEM, PA., Nov., 1877. FRANCIS WOLLE.

PHYCOCHROMOPHYCEAE.

1. **Chroococcus,** Naeg. — Ch. decorticans, A. Braun. Hab. Submerged timbers.

Ch. rubrapunctus, n. sp. C. aquatica, cellulis singulis vel aggregatis in ligno submerso; cellulis simplicibus, globosis; membranula gelinea tenui cinctis; cytioplasmate flavo-aurantiaco, homogeneo, nucleo amplo, auranteo-rubro. Cellul. .00008″–.0001″.

Not infrequent on boarded sides of basins and old timbers.

2. **Gloeocapsa,** Ktz.—Gl. fenestralis Ktz. Greenhouses.—Gl. conglomerata, Ktz. On filaments of old Cladophora, Colorado. (T. C. Porter.)—Gl. rupestris, Ktz. Wet rocks, Little Falls, N. J. (C. F. A.)

3. **Anacystis,** Meneghini.

A. glauca, n. sp. A. thallo glauco-aerugineo; strato indeterminato fundis calcariorum fontium; cellularum familiis oblongis vel ovalibus, saepe non distincte limitatis; tegumentis tenuibus; cellulis minimis et numerosissimis, pallide aeruginosis. Cellul. .00008″–.0001″. Fam. .005″ plus minus.

4. **Gloeothece,** Naeg.—Gl. confluens, Naeg. Calcareous springs, Newton, Mass. (W. G. Farlow.)—Gl. granosa, Rabenh. Wet rocks.—Gl. distans, Stiz. Dripping rocks.

5. **Leptothrix,** Ktz.—L. parasitica, Ktz. On old culms in swampy places.—L. ochraceum, Thuret. Small pools.—L. muralis, Ktz. Damp walls; common in greenhouses.—L. caespitosa, Ktz. Calcareous springs.—L. rigidula, Ktz. Aquariums.

6. **Hypheothrix,** Ktz.—H. coriacea, *var.* Meneghinii, Ktz. Damp earth, N. J. (C. F. A.)—H. pallida, Ktz. Forms a reddish-brown stratum on dryish ground, N. J. (C. F. A.)—H. turicensis, Naeg. Moist rocks.

H. bullosa, n. sp.—H. thallo subsphaerico, dilute flavo, flavo-albo, gregario; filamentis tenuibus, simplicibus, dense intricatis, globis cavis tenacissimis formatis; globis 2–4 lineas diametro; trichomatibus pallide aerugineis, saepius pallescentibus, .00006″, diam.; vaginis achrois, .00016, raro .00024″.

Shallow sluggish waters, often intermingled with a vagarious form of Lyngbia Wollei, Farl. Susquehanna River, Harrisburgh, Oct., 1877.

H. Aikenensis, n. sp.—H. filamentis tenacibus, curvatis, densissime intricatis, in stratum plus minus expansis, olivaceo-viridibus; trichomatibus (interne) passim interruptis, saepius moniliformibus (praesertim in speciminibus in carbolico acido tempore brevi asservatis) articulis diametro subequalibus vel duplo longioribus, granulatis; cytioplasmate laete aerugineo; vaginis sat amplis, achrois, pellucidis. Diam. cum. vag. .00032″–.00044″; sine vag. .00014″–.00018″.

Sluggish waters, Aiken, S. C. (H. W. R.)

7. **Beggiatoa,** Trevisan.—B. niveum, Rabenh. Sulphur Spring, Niagara Falls, 1876.

B. hinnulea, n. sp.—B. strata colore dilute hinnulea, floccosa, caespitosa, fluctuans, 2–3 lineas crassa; filamentis flexilibus, contractilibus, evaginatis, indistincte articulatis, 6–9 lineas longis, .00005″–.00007″ crassis, hyalinis, subachromatibus, cytioplasmatibus obscure granulosis.

Trenches for warm waste water from steam engines.

8. **Oscillaria,** Bosc.—O. violacea, Wallr. Conservatories.—O.

Cortiana, Ktz. Common in hot waters.—O. leptotrichia, Ktz. Ponds.—O. elegans, Ag. Quiet waters.

9. **Phormidium,** Ktz.—Ph. vulgare, *var.* publicum, Ktz.—Ph. Lyngbyaceum, Ktz. Old logs partially submerged.—Ph. cataractum, Rabenh. Waterfalls, Mill-dams.—Ph. olivaceum, Rabenh. Small ponds.

10. **Lyngbya,** Ag.—L. Cincinnati. Colorado. (T. S. B.)

11. **Hydrocoleum,** Ktz.—H. phormidioides, Bulnh. Sphagnum swamps.—H. tinctorum, A. Br. Aquatic plants.—H. homoeotrichum, Ktz. Stones in rapid waters.

H. Ravenelii, n. sp.—H. terrestre, rubre fuscescens, in stratum plus minus expansum; trichomatibus plerumque .0005″, aerugineis vel aerugineo-fuscescentibus, saepius singulis, nonnunquam geminis vel ternis, rectis vel leviter contortis, aequalibus; articulis diametro duplo triplove brevioribus, irregulariter granulatis; vaginis plantae novae angustis, achrois, pellucidis; aetate provectae amplis, saepe distincte lamellosis, firmis, pulchre luteo-fuscis, superficie laevissimis; diametro cum trichomatibus singulis .0008″–001″; apice saepe conico.

Pasture grounds, Houston, Texas. (H. W. R.)

12. **Dasygloea,** Thwaites.—D. amorpha, Berk. Wet rocks, mountain ravine.

13. **Symploca,** Ktz.—S. Friesiana, Ktz. Coll. J. Macoun, Canada.

14. **Inactis,** Ktz.—*I. Austinii,* n. sp. Thallis fuscis, nigro-virescentibus, subhemisphericis, convexo-planis; singulis, 2–3 lineas diametro, saepe aggregatis, confluentibus; filamentis firmis, cylindricis, plus minus ramosis, fasciculatim concretis, plerumque distincte articulatis; articulis diametro duplo triplove longioribus, atro-aerugineis; vaginis arctissimis, achrois.

Coll. C. F. Austin. Wet rocks, Little Falls, N. J., 1867.

15. **Entothrix,** Ktz.—*E. grandis,* n. sp. E. tubulosa, fusca, basi affixa, caespitosa, rigida; trichomatibus articulatis, plus minus ramosis, 100–150 in funiculum dense contortis, hyalino-lutescentibus, .0003″ crassis; vagina crassa, opaca, obscure reticulata. Diam. .030″–040″, circiter semilinearis.

On stones in shallow rivers.

16. **Nostoc,** Vauch.—N. glomeratum, Ktz. On filaments of old Cladophora. C. L. Anderson, Cal.—N. pruniforme, Roth. Pool of limpid water.—N. cristatum, Harvey. Abundant on stones; Susquehanna at Harrisburgh; Palisades, N. J. Not, therefore, confined to the high mountain ranges, as suggested by Dr. Wood.—N. riparium, Cess. Dripping cliffs, near waterfalls.

17. **Anabaena,** Bory.—A. stagnalis, Ktz. Pools.

18. **Trichormus,** Allman.—T. incurvus, Allm. Old wood, N. J. (C. F. A.)

19. **Cylindrospermum,** Ktz.—C. riparium, Ktz. On aquatic plants.

20. **Sphaerozyga,** Ag.—S. variabilis, Ktz. On pond plants.

21. **Chaetococcus,** Ktz.—*Ch. acicularis,* n. sp. Ch. in familiis plerumque circularibus, molliter gelatinosis; cellulis numerosis, sphaericis, capitatis cum una acicula, plus minus elongata; cytio-

plasmate initio homogeneo, flavo-viridi, postea granulato, fuscescente. Cellul. .0004″–0005″; fam. ad. .004″.

On culms of Sagittaria.

22. **Zonotrichia,** I. Ag.—Z. haematites, Rabenh. Stones, Susquehanna River.—Z. paradoxa, Wolle. This is the same species described last year, but with evidence of fructification by spherical spores; these form about the middle of the trichoma; in size they fill the diameter of the sheath and when matured are ejected through the open, broken-off end of it.

23. **Mastigothrix,** Ktz.—M. aeruginea, Ktz.

M. turgida, n. sp. M. flagelliformis, plus minus distincte articulata; articulis plantae novae in partibus basim proximis diametro aequalibus; aetate provectae 3–4-plo brevioribus; apice piliformi, achroa, hyalina, cuspidata, cellulis elongatis, diametro 4–6-plo longioribus; basi turgida, saepius curvata; trichomatibus initio aerugineo, deinde violis vel flavis; cellulis perdurantibus, fulvo-fuscescentibus, compresso-globosis vel concavo-convexis. Basis diam. .0006″–.0008″.

Scattered, or in small clusters, in gelatinous coatings on submerged timbers.

24. **Amphithrix,** Ktz.—A. villosa, Ktz. River stones.

25. **Mastigonema,** Schwabe.—M. paradoxum, Ktz. Wet sides of wooden water box.

26. **Scytonema,** Ag.—Sc. tomentosum, Ktz. Wet rocks, Haverstraw, N. Y. (C. F. A.)—Sc. cinereum, Menegh. Goodwinville, N. J. (C. F. A.)—Sc. Naegelii, Ktz. Dry rocks, Goodwinville, N. J. (C. F. A.)—Sc. gracile, Ktz. Wet mountain cliffs.—Sc. Castelli, Massal. Abundant on moist wood, flower pots, etc., in greenhouse, Harrisburgh.

Sc. Brandegei, n. sp. Sc. rupicola, fusco-atrum, strato firmo; filamentis validissimis, dense intricatis; pseudoramulis plerumque geminis, elongatis, apicibus dilutioribus, pellucidis, dimidio circiter tenuioribus quam filamentis, ad apicem haud attenuatis, obtuso-rotundatis; trichomatibus sordide aerugineis, granulosis, distincte articulatis; articulis diametro subaequalibus, nonnumquam 2–3-plo brevioribus, saepe moniliformibus; vaginis crassis, distincte lamellosis, aureo-fuscis, saepe apertis, trichomata superantibus; cellulis perdurantibus, interjectis, oblongis vel compresso-sphaericis. Diam. trich. cum. vag. .0015″–.0016″.

This is the largest of the Scytonemas hitherto discovered. It looks akin to Sc. Hegetschweileri, Itz., Sc. tolypotrichoides, Ktz., and Sc. cataracta, Wood, but beside being much thicker, it differs from each in a number of features. Wet rocks, Colo. (T. S. B.)

Sc. *badium*, n. sp. Scy. strato tenui, fuscescenti, badio; filamentis suberectis, adpressis, brevibus; pseudoramulis flaccidis, divaricatis, singulis vel geminis; trichomatibus initio dilute aerugineis, modo continuis, modo distincte articulatis, .00008″–.0001″ diam., articulis subaequalibus; vaginis amplis luteolo-olivaceis, .00016″–.0003″; cellulis perdurantibus interjectis vel basliaribus, subglobosis vel oblongis. Old wood, Herkimer Co., N. Y. (C. F. A.)

This plant has somewhat of an indefinite character, not unlike

Sc. truncicola, Rabenh.; sometimes it assumes the character of a Tolypothrix.

27. **Tolypothrix,** Ktz.—T. Bulanheimii, Rabenh. Small meadow pools.—T. Wartmanniana, Rabenh. Gelatinous coating on old wood under spray of waterfalls.—T. geminata, A. Br. Wet cliffs, Pike Co; rather a doubtful species; probably a young growth of Scytonema, as suggested also by Dr. Rabenhorst.

T. rupestris, n. sp. T. strato late longeque expanso, gelatinoso, viridi-fusco-nigrescente; trichomatibus tenuibus pseudoramulis elongatis, laxe intricatis; internis aerugineis, distincte articulatis, granulosis, diametro aequalibus, ad duplo longioribus; vaginis amplis, achrois vel luteolis; cellulis perdurantibus, subglobosis vel oblongis, 2–3 seriatis. Diam. cum. vag. .00055″; sine. vag. .00032″–.0004″. Wet rocks, Delaware Water Gap.

28. **Sirosiphon,** Ktz.—S. Crameri, Brügg. Sphagnum swamps, N. J. (C. F. A.) Differs from the typical form in not having the end cells of the trichoma cylindrical, but short and compact, usually 3 or 4 to diameter.—S. Alpinus, Ktz. Wet mountain cliff, Pike Co.—S. coralloides, Ktz. Dry rocks, N. J. (C. F. A.)—S. lacustris, Rabenh. Moist rocks, N. J. (C. F. A.)

CHLOROPHYLLOPHYCEAE.

29. **Pleurococcus,** Menegh.—P. dissectus, Naeg. Bark of Pine-trees.

P. lateritius, n. sp. P. aereus; strato mucoso, fusco-rubro; cellulis globosis et singulis et 2–4–8 in familiis subsphaericis consociatis, plerumque in partes quatuor lineis fuscis dissectis; cytiodermate firmo, sordide fusco-rubro, haud lamelloso; cellulis singulis .0003″–.0006″; fam. .0008″–.0013″. Old boards, Aiken, S. C. (H. W. R.)

30. **Gloeocystis,** Naeg.—G. Paroliniana, Naeg. Moist and dripping rocks.

31. **Palmella,** Lyngb.—P. uviformis, Ktz. Outside of wooden tanks.—P. mucosa, Ktz. Wet ground.

32. **Tetraspora,** Link.—T. Stereophysalis, Ktz. Mountain pools.—T. fusca, Breb. Pools.

33. **Hormospora,** Creb.—H. *intermedia*, n. sp. H. solitaria aut sparsa; tubulis subamplis, subfirmis; cellulis ante divisionem, diametro sesqui vel duplo longioribus, oblongis, arcte connexis, polo truncatis vel rotundatis; post divisionem primam subsphaericis, sed post divisionem secundam diametro duplo brevioribus, subtiliter granulosis; cytiodermate cellularum tenuissimo; filamentis primo .0003″–.0004″; post divisionem cellularum saepe .0006″–.0007″.

Pools, not infrequent. Distinguished from H. geminella, Wolle, by its thinner filaments, much lighter structure and different mode of division of cells; rarely they divide longitudinally, and give the filaments an undulating outline. H. pygmaea, Wolle, has more of a gelatinous structure.

34. **Hydrurus,** Ag.—H. Ducluzelii, Ktz. Mountain streamlets.

35. **Chlorococcum,** Fries.—Ch. olivaceum, Rabenh.—Ch. Wimmeri, Hilse. Dripping mountain cliffs.

36. **Kalodictyon,** novum. genus. Filamenta breviora, moniliformia, extremis in conoebium distensum retioulatum connexis; maculae hexagonae. Propogatio adhuc ignota.

K. margaritatum, n. sp. K. coenobio retiformi, indefinito numero hexagonis reticulationibus; filamentis tenuibus, dilute fuscis, persertis cum triangulis et oblongis formis. Formae et triangulae et oblongae subhyalinae margaritae similes, angulis rotundatis et lateribus modice concavis, per centrum omnes persertae, et ordinatae cum triangulis formis in angulis reticulationum, et oblongis formis in lateribus. Coenobium distensum in diluto muco in foliis Potomogetonis. Reticulationes paucis viridibus cellulis irregulariter distributis. Diam. ret. .0025″–.003″; triang. .00064. oblg. .0006″–.0013″.

Slow river waters on Potamogeton; a rare and very remarkable plant.

37. **Hydrianum,** Rabenh.—*H. subsessile*, n. sp. H. erectum, globosum, ellipticum, subsessile vel inferne in stipitem brevem subito attenuatum; apice nonnumquam late rotundato, saepius in tubuli formam, tubuli plantae diametro duplo breviore; cytioplasmate viridi, initio in corpusculum globosum conglobato, deinde in zoogonidia multa soluto, quae per tubulum apertum singula elabuntur. Diam. .00028″–.0003″.

Parasitic on Cladophora, etc.

H. giganteum, n. sp. H. cellula stipitata, lanceolata, erecta, vertice obtuse rotundata, demum aperta, medio .010″–.015″ diametro, 8–10-plo longiore, utroque polo subequaliter attenuato et subequali diametro, .004″–.005″; cytiodermate cartilagineo, obscure aerugineo, vel fulvo-fuscescente, laevi, basi disciformi dilatata, quae bases multae conjunctae continuum cartilagineum thallum formant in submersis sarmentis; cytioplasmate aquoso, paucis minimis cellulis.

Collected by J. Donnel Smith, head of St. Lucie River, Florida, March, 1877, from submerged twigs.

38. **Chlamydomonas,** Ehrb.—Ch. pulvisculus, Ehrb. Greenhouse tank.

DESMIDIACEAE.

39. **Palmagloea,** Ktz.—P. macrococca, Ktz. Intermingled with river plants.

40. **Penium,** Breb.—P. Naegelii, Breb. Dripping rocks.—P. margaritaceum, Breb. Pools.

41. **Sphaerozosma,** Corda.—S. vertebratum, Ralfs.—S. pulchrum, Bailey. Sluggish waters, Pike Co.

42. **Cosmarium,** Corda.—C. praemorsum, Breb.—C. Biretum, Breb.—C. Phaseolus, Breb.—C. sportella, Breb.—C. latum, Breb.—C. moniliforme, Ralfs. All from pools.—C. Schliepackeanum, Grun. Wet rocks.—C. cruciatum, Breb. Swamps.

C. irregulare, n. sp. C. fere tam longum quam latum, profunde constrictum, sinu mediano lineari; cytiodermate verruculoso; verruculis in series curvatas dispositis; semicellulis diametro plerumque fere duplo longioribus; dorso late et plane truncato; angulis inferioribus rotundatis, indistincte crenulatis, lateribus irregulariter crenatis; crenis inferioribus brevibus sed ad angulos superiores gradatim auctis,

duobus tribusve ultimis amplis sinu profundo. Long. .0026″–.003″; lat. .0024″–.003″. Sphagnum swamps. In size and general form this Desmid is near C. Botrytis and C. Ungerianum, but differs conspicuously in the irregular size of the crenulations, the unusual prominence of those next the outer angles, and the plane truncate apices.

43. **Arthrodesmus,** Ehrb.—A. octocornus, Ehrb. Ponds.

ZYGNEMACEAE, Etc.

44. **Spirogyra,** Link.—Sp. tenuissima, Ktz.—Sp. communis, Ktz. Ponds.—Sp. Grevilliana, Ktz. Fresh water pools.

45. **Rhynchonema,** Ktz.—Rh. vesicatum, Hassel. Small pools.

46. **Zygnema,** Ag.—Z. Stellinum, Ag.—Z. Vaucheria, Ag. Quiet waters.

47. **Mesocarpus,** Hassel.—M. scalaris, Hass. Dr. Wood quotes this genus, but illustrates a young fruiting specimen of Pleurocarpus; hence it may be questioned whether he saw a genuine specimen.—M. nummuloides, Hass.—M. angustus, Hass. Both frequent in pools, wet rocks, etc.

48. **Vaucheria,** DC.—V. uncinata, Ktz.—V. Dillwinii, Ag. In addition, I found for the first time the following, quoted by Dr. Wood: V. geminata, V. aversa and V. caespitosa.—*V. reptans*, on last list, should be *repens*.

49. **Prasiola,** Ag.—P. Mexicana, Liebm. This interesting plant was collected by Mr. Brandegee, attached to stones in rapid waters, in the high mountain regions of Colorado.

50. **Gloeotila,** Ktz.—G. mucosa, Ktz. Small pools.

51. **Microspora,** Thuret.—M. floccosa. Streamlets of spring water, Penn. and Col.—M. fugacissima, Roth. Rain water pool in woodlands.—M. vulgaris, Rabenh. Frequent in trenches.—M. laevis, Rabenh. Spring waters, here and in Florida.—M. amoena, Ktz. Ponds.—M. punctalis, Rabenh. Meadow pools, etc.

52. **Conferva,** Link.—C. affinis, Ktz. Ponds.—C. utriculosa, Ktz. Ponds.—C. rhypophila, Ktz. Slow river waters, Harrisburgh.

53. **Cladophora,** Ktz.—Cl. flavescens, Ag. I find a variety in large ponds which agrees well with this species; however, not "submarine."—Cl. crispata, Grun., *var.* vitrea, Ktz. Pools.—Cl. horrida, Ktz., a var. of Cl. fracta, Dillw. Yellowstone Springs, Col. Collected by T. C. Porter.—Cl. insignis, Ag. Florida. (J. D. Smith.)—Cl. rigidula, Ktz. Cold springs.—Cl. aegagropila, Linn. Sluggish waters.

Cl. Vaucherioides, n. sp. Cl sordide viridis; libere natans, aggregata, nubeculas formans, subrigida; ramis subelongatis, secundis, tenuibus; filamentis .004″–.005″, articulis longissimis, 12–20-plo longioribus; cytioplasmate granulato, effuso, parietali; cytiodermate laevo, tenui, homogeneo, Vaucheriae simili; septis transversis filamentorum et ramulorum tenuissimis, indistinctis, saepe difficile visibilibus; geniculis non constrictis; ramulorum insertione non apicali. Small ponds. The thin cytioderm, the very thin division walls, and the long cells characterize this plant as a very distinct species.

54. **Oedogonium,** Link.—Oed. rostellatum, Pringsh.—Oed. vesi-

catum, DC.—Oed. Pringsheimii, Cramer.—Oed. depressum, Pringsh.—Oed. echinospermum, A. Br.—Oed. rivulare, L. le Clerc. Florida. (J. D. S.)—Oed. affine, Rabenh. —Oed. capillare, Ktz. Submarine waters, Cal. (C. L. Anderson.)—Oed. grande, Ktz.—Oed. Montagnei, F. Mazz.—Oed. hexagonum, Ktz.—Oed. scutatum, Ktz.—Oed. ochroleucum, Ktz. Cal. (C. L. And.)—Oed. fasciatum, Ktz.—Oed. tenellum, Ktz.—Oed. delicatulum, Ktz.

Oed. apiculatum, n. sp. Oed. cellula basili bi-tri-lobata, articulo terminali apiculato; articulis diametro plerumque, .0006″-.0008″, 2½ – 3-plo longioribus, subcylindricis, vel sursum paulum dilatatis, inaequi-crassis, proximis supra oogonium saepe multo minoribus, deinde gradatim dilatatis, saepe .0005″ ad .0015″; oogoniis ovalibus modo singulis, modo 2–5 continuis, plerumque superiore polo paullum productis; oosporis ovalibus, diam. .0015″, long. .002″-.0025″; antheridiis bi-cellularibus. Pools, and slowly flowing waters.

Oed. setigerum, n. sp. Oed. cellula basali disciformi dilatata, articulo terminali attenuato et plerumque in setam hyalinam longe producto; articulis diametro .0008″-.0012″, 3–6-plo longioribus, sursum incrassatis, subclavatis; oogoniis singulis aut pluribus, singulis obovatis, sed si continuis truncato-ellipticis; oosporis in forma oogonii arcte involutis; antheridiis quaternis cellulis.

Pools, fringing old culms, etc.

55. **Bulbochaete,** Ag.—B. setigera, Ag.—B. intermedia, de By.—B. gigantea, Pringsh.—B. crenulata, Pringsh.—B. minor, A. Br.—B. gracilis, Pringsh. Everywhere in stagnant waters; beside those of this vicinity I received specimens from Cal., Colo., S. Car. and Florida.

56. **Hormiscia,** Aresch.—H. zonata, Aresch. Cold spring, Slate region.—H. moniliformis, Ktz. Sphagnum swamps, N. J. (C. F. A.)—H. rigidula, Ktz. Calcareous spring.

57. **Ulothrix,** Ktz.—U. thermarum, Wartm. Trenches of warm waste water.—U. variabilis. Mountain streamlets.—U. stagnorum, Rabenh. Meadow pools.—U. subtilissima, Rabenh. Mountain springs.—U. oscillarima, Ktz. Calcareous springs.

58. **Chroolepus,** Ag.—Ch. odoratum, Ag. Shade trees.—Ch. moniliforme, Naeg. Stones, mountains of New York and New Jersey. (C. F. A.)—Ch. iolithus, Ag. Mt. Washington, N. H. (C. F. A.)—*Ch. corticulum.* I associate this name with a variety of Ch. aureum, particularly common on the trunks of trees in the Southern States, forming a loose, green stratum.

59. **Poterophora,** novum genus. Aërea; fila articulata, varie ramulosa; genicula et cellulae terminalia saepe ~~in~~ cellulis fructiferis urceolatis ~~consistenti~~a. instructa

P. Donnellii, n. sp. P. aërea, strato viridi, molli, intricato vel pulvinulo; filis distincte articulatis, varie ramosis, articulis .0015″-.002″ diametro, plerumque duplo triplove longioribus, nonnumquam aequalibus, dilatatis, subsphaericis; ramulis enormibus, modo lateralibus, modo apicalibus, saepe tenuioribus; geniculis et cellulis terminalibus saepe formis urceolatis ~~con~~structis; novas gemmas gignentibus, primo sphaericas, deinde elongatas, divisas, nova filamenta procreantes.

Bark of trees, Florida. (J. Donnell Smith.)

60. **Stigeoclonium,** Ktz.—St. flagelliferum, Ktz. Meadow pools, —St. longipilus, Ktz. Slow waters.—St. fasciculare, Ktz. Rapid waters.—St. portensum, Ktz. Parasitic on Cladophora, etc., Santa Cruz, Cal.—St. nudiusculum, Ktz. Mountain streamlet. These five harmonize well with Kützing's diagnosis, but the characters of two as distinct species may be questioned.

61. **Chaetophora,** Schrank.—Ch. longipila, Ktz. Old culms in ponds.—Ch. endiviaefolia, Ag. Smaller pools, here and New Jersey. (C. F. A.)

62. **Gongrosira,** Ktz.—G. sclerococcus, Ktz. Stones in small streams.

63. **Coleochaete,** Breb.—C. orbicularis, Pringsh. Aquatic plants. —C. pulvinata, A. Br. Submerged twigs, spring water.—C. divergens, Pringsh. Leaves of pond plants.

64. **Chantransia,** Fries.—Ch. violacea, Ktz. Limestone springs. I received also Ch. macrospora from South Carolina, a beautiful species described by Wood.

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§ 198. **Gentiana Andrewsii,** Griseb.—Gentiana Andrewsii, as it grows in my woods, behaves differently from what it does as described by your correspondents. The flowers do not last a long while, if by flowers are meant individual flowers, or the corolla. There is a long succession of flowers, but in my locality the individual corolla soon begins to fade. The ovarium, however, continues to grow, and soon pushes itself through the mouth of the corolla, exposing the stigmatic surfaces, which remain in a receptive condition for sometime after exposure. An insect could cross-fertilize it, when in this condition, wholly from the outside. The only difficulty with me is, that I do not see where the pollen to cross-fertilize is to come from. Mr. Darwin teaches that pollen from the same plant, or from plants growing under similar conditions, is practically no cross-fertilization; but with me, bees or other insects do not go into one flower on one plant, and then away, to another many yards away, then returning, and again going back, continuously going and coming, as a zealous cross-fertilizer, so beautifully arranged by nature, should do; but they go from flower to flower on the same plant, or on plants in the vicinity, till all are done; at least this is the case with me, whatever they may do elsewhere.

However, it is well to recognize the fact, that plants, and, no doubt, insects, behave differently in different places. For instance, Mr. Darwin from English experiments utterly denies that *Linum perenne* can fertilize itself by its own pollen. He says we may as well "sprinkle over it so much inorganic dust." But a single plant,[1] which I brought with me from Colorado in 1873, bears fruit freely in my garden every year. It shows that how a plant may behave in one place is no rule as to how it will elsewhere.

My Gentiana Andrewsii is not out of flower yet. I send you a flower with exserted stigmas. THOMAS MEEHAN.

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[1] = L. Lewisii !! [illegible] Darwin

§ 199. **Danthonia Faxoni,** *n. sp.*—Culmo cæspitoso valido rigido teretiusculo sesqui-bipedali simplici vel raro ramulo singulo subincluso ex articulatione superiore progrediente; foliis mediocriter longis latiusculis circa 13-nervatis (nervibus in siccis utrinque prominulis) planis vel siccitate convolutis nudis, ligula pilosa; panicula subdecomposita, spiculis (circa 15) floribus 6–7 gerentibus, glumis magnis flores superantibus 5-nervatis, paleis ut in *D. spicata*, BEAUV. (7-nervatis, etc.). Notch of the White Mountains, New Hampshire (associated with D. compressa, AUST.), Sept. 3d, 1877 (scarcely mature), *C. E. Faxon.* This species is nearer to *D. spicata* than to any other known to me; but that has a more slender, always *simple*, culm, narrower, more convolute *hairy* leaves, a more simple panicle, with the spikelets and glumes rather smaller. Furthermore, it matures much earlier (by the middle of July). *D. Alleni*, AUST., is larger, with more branched culms, broader leaves, with the nerves prominent only on the underside; panicle larger, palea, with the awn longer and less twisted when dry, glumes shorter, etc.

With our other species, *D. sericea*, NUTT., and *D. compressa*, AUST., it is not possible to confound it. C. F. AUSTIN.

§ 200. New Musci.

Archidium Donnellii, *n. sp.*—Proxime accedit ad *A. Ohioensem*, SCHIMP.; differt tamen statura robustiore, colore stramineo-vel lutescente-viridi, foliis tenuioribus subscariosis cellulis multum minus distinctis subechlorophyllosis, flore masc. in ramulo magis minusve elongato subgracili terminali.—Hampden County, Va., April, 1877. —*J. Donnell Smith.*

By the inflorescence this species is allied to A. Hallii, AUST.; but that has the leaves much more loosely reticulated, etc.

Bartramia radicalis, BEAUV., Var. **Porteri.**—*B. Porteri*, AUST., Mss.—A forma normali differt; pedicello dimidio breviore, capsula siccitate globosa paulo inclinato (haud horizontali) indistinctius costata, membrana exteriore laxiore, peristomio dentibus solidioribus (semper?) processibus longioribus? ciliis nullis? On wet rocks and banks, Western Pennsylvania, *Garber* in Herb., Porter; Rockdale (Lehigh Valley) *Wolle;* Oneida, New York, *Warne;* Ohio, *Dr. Beardslee, Miss Biddlecome.*

Apparently a distinct species; but the shape and texture of the leaves and the inflorescence are as in the typical *B. radicalis* from the South. C. F. AUSTIN.

§ 201. **A new Cheilanthes.**—I have detected among some specimens of Cheilanthes Cooperæ sent out by Dr. Parry, a new species to which I have given the name of C. viscida—the Sticky Lip-Fern —on account of the peculiar viscid glands with which the whole plant is so profusely covered, that, if placed in warm water, it soon converts it into a thick glutinous liquid. Even in the dried state the plants are so sticky that the fronds adhere together in a brittle mass, and it is extremely difficult to separate them without their crumbling all to pieces. I submit the following description as the best I am able to give from the meagre specimens at hand:

1- Sup. 200.

Cheilanthes viscida, n. sp.—Roots tufted; stipes 2′ to 4′ long, very dark brown, densely clothed at the base with light brown, narrowly lanceolate or linear, long-pointed, entire scales, and with a few scattered, small, thin scales, or none, above, glandularly rough; fronds light green, 3′ to 5′ long, ¾′ to 1′ broad, lanceolate, 2 to 3 pinnate, covered, especially beneath, on the rachis and upper part of main stalk, with *distinct, sticky, resinous glands;* pinnæ deltoid, short-stalked, lowest pair distant; pinnules ovate-lanceolate or oblong, basal one sub-sessile, lower series longest and sub-pinnate or deeply pinnatifid, upper series pinnatifid, cut down into narrow oblanceolate divisions, decurrent on the broadly-winged rachis, the segments again cut into 3 to 5 lobes, the recurved tips forming distinct involucres.

Hab. California, clefts of rocks?

First collected by Mr. J. G. Lemmon on the White Water Canyon in the Colorado Desert, afterward at Downieville Buttes (Mr. Lemmon), and later, April, 1876, on the eastern (desert) slope of the Sierra Nevada, near San Gorgorio Pass, by Dr. Parry and Mr. Lemmon (No. 427, Flora Southern California).

The species appears intermediate between C. vestita, Swartz, and C. Cooperæ, Eaton, but the former differs from it in its larger size, its hairiness, and the total absence of glands; while the latter may be readily distinguished by the darker scales at the base of the stipes, its broader, less divided fronds, more obtuse divisions, and especially by its very *distinct glandular-tipped hairs.* The species will be figured in an early number of the *Illustrations of the Ferns of North America*, noticed in the August No. of the BULLETIN, p. 169.

BOSTON, July, 1877. GEO. E. DAVENPORT.

§ 202. **Publications.**—1. *Notes on Botrychium simplex, Hitch.*, by Geo. E. Davenport: This monograph will delight all who enjoy a work thoroughly well done, both in the treatment of the subject and the typographical investment. Prof. John Robinson, of Salem, Mass., has had printed but a very small private edition, at the low price of one dollar, including postage, and we advise all lovers of ferns to apply for it without delay, as we confidently predict that in a short time it will only be procurable for its weight in silver at least. Size, 10x12 inches; pages, 22; elegantly printed on heavy plate paper. It is now clear from Mr. Davenport's investigations that Prof. Hitchcock's original drawing represents a distinct species, but that his description was made partly from immature specimens of this or perhaps some allied species. The object of Mr. Davenport was to determine "some external character by which the species may be distinguished from the other small Botrychiums." He finds this in "the presence of two stalked divisions, approximate to the rhizoma, in precisely the same manner as in B. ternatum." In two plates, drawn by Emerton after tracings made by Mr. Davenport from the specimens themselves and engraved by the heliotype process, he has illustrated the forms from nearly every known locality. The first plate, with the exception of three of Hitchcock's dubious specimens, represents the true B. simplex; the second, the forms which have been mistaken for it. There are in all about 50 figures. The comparison of Mr. Miller's fine mature specimen with his immature ones is very suggestive. In doubtful cases Mr. Davenport finds with Milde that the size and marking of the spores is quite decisive. Mr. Davenport, in his examination of this genus, has arrived at other valuable results, some of which we hope to present in the next No.—2. *Botanical Gazette :* The January No., the first of Vol. III., will appear about the middle of December. Contributions have been promised by many botanists of distinction, and, when needful, the leading articles will be illustrated. In the September No. is a note on the natural grafting of *Carpinus Americana* on *Fagus ferruginea.* "The trees had started close together and had coalesced, their bark had become continuous, and below, where they fork, it is impossible to tell which is which." We have noticed a similar case on Bergen Point, N. J., a young Carpinus apparently growing out from the trunk of a Fagus, not far above the ground.

§ 203. **Oswego Plants.**—Last summer I found in "Lily Marsh," nine miles east of this city, in great quantity, an orchid, *Listera australis*, Lindl., new to our State and not before found north of New Jersey. In the same locality abounds the Spruce parasite, *Arceuthobium pusillum*, Peck, [*A. minutum*, Englm.,] and *Habenaria leucophaea*, Gray, the latter only found hitherto, in New York, by Mr. Hankensen, in the near Wayne Co. I found there also *Spiranthes Romanzoviana*, Chamisso, and *Pogonia verticillata*, Nutt.

Pogonia pendula, Lindl., grows abundantly in the woods north-east of the romantic Round Lake, near Fayetteville, Onondaga Co. *Cypripedium spectabile*, Swartz, is very common in the swamp, belonging to Thomas Kingsford, next to the City limits. *Rhyncospora* h *macrostachya*, Torr., I found five miles south-west of the City, on the border of Mud Lake—so far from the Atlantic!

J. Herman Wibbe, Ph. Dr.

St. Peter's Church, Oswego.

§ 204. **Shortia.**—Dr. Gray believes in Shortia, but yet did not find it. We shall have to send a Dr. fresher from New York.

§ 205. **Obituary.**—Many of our readers will be shocked to hear of the sudden death of that most genial botanist, Mr. Henry D. Keeler, formerly of Mayport, Fla. About a year since, he removed to this city, having been offered a very eligible position. In August last he was devoting his vacation to a sort of botanical trip up the Connecticut valley. He had reached Branford Point, Conn., when he was taken suddenly and violently ill during the night, and, notwithstanding the best medical attendance and most careful nursing, lingered but a few days. His disease was paralysis of the bowels. He was in the 29th year of his age.

§ 206. Erratum.—§ 190, Gentiana Andrewsii, four lines from end, for "but" read "not".

Terms—One Dollar per annum beginning with the January number. For the Botanical Directory 30 cents Supplement to Directory, 10 cents. Vols. I.-V., with index, and photograph of Dr. Torrey, $3.75. Copies of Constitution and By-Laws of the Club, 25 cents. Address, Wm. H. Leggett, 54, *East 81st Street, New York. Money Orders on Station K, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend. Dr. Thurber, *the President of the Club, may be found at 245 Broadway.*

Vol. VI., No. 37.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Jan., 1878.

§ 207. VERNATION IN BOTRYCHIA,

With special reference to its importance as a means for distinguishing the different species.

The difficulty in being able at all times to distinguish and separate the different species of Botrychium, on account of the numerous intermediate forms that apparently connect them with one another, has led many excellent botanists to regard all of the smaller species as modifications of one original type, and even to connect them with the larger species through a graduated succession of forms. Thus *B. Virginianum* is reduced through the Var. *gracile* to *B. lanceolatum*, which passes through *B. matricariaefolium* into *B. Lunaria*, which, in its turn, passes into *B. simplex*, the ternate form of which connects by another graduated series with *B. ternatum*. The difference in the time of the fructification of the several species in this arrangement is apparently lost sight of, or regarded as of no consequence. But this theory, in place of relieving, tends rather to increase perplexity, and makes the study of the genus even more difficult, as, after all, it does not lead to any satisfactory conclusion, or uniformity among botanists, and, at best, can only be considered as an easy but very unscientific method of evading difficulties that a more searching investigation would overcome.

All of these difficulties, however, come from relying too much upon merely external characters, and not paying sufficient attention to the internal structure and organs of reproduction. No good species can exist without possessing characters by which it may at all times be identified. Sometimes these characters are conspicuous, while at other times they are so concealed as to require a very careful examination to discover them, but in some form or other they are always present.

That the different species of Botrychium are distinctly characterized I have no doubt whatever. But the many intermediate forms that occur show that external characters at times are not to be depended upon for distinguishing the different species under all of their modifications. Happily each species contains within itself unvarying characters by which we may at all times recognize it, and these characters are to be found either in the buds or spores.

As the character of the spores can only be determined by a very high microscopical power, I shall not describe them in my present paper, but confine myself to a description of the buds, the form of which can be readily seen with an ordinary pocket lens, and in the larger specimens with the naked eye, thus being within the reach of ordinary observation.

Having examined a large number of buds, in living and pressed specimens, of all our North American Botrychiums, I have found that, however much a species varies in its external characters, the form of the bud always remains the same.

In *B. ternatum* and in *B. Virginianum* the buds are pilose, but differ so much from each other in form that there would be no difficulty whatever in separating these two species by their buds alone, even if their external characters were similar. In all of the smaller species the buds are perfectly smooth, and this proves conclusively that they cannot be mere modifications of the larger species.

In very young specimens of the smaller species, where the bud has not yet developed into its peculiarly distinctive character, there is an apparent limit in the extent to which we can rely upon these bud-forms, and it may be necessary in some cases, when there is a doubt otherwise in regard to the specimens, to examine the spores, which never vary. Yet, although in the youngest, undeveloped conditions of the plant the bud can hardly be said to have any form beyond a merely simple and erect one, still even in very young buds of corresponding specimens there is usually a significant development of the common stalk that distinguishes them from each other. In *B. matricariae-folium*, for example, the matured form of the bud is so distinct from that of every other species that one could not possibly mistake it for any other, yet, in its earlier stages of development, it at one time bears some resemblance to the matured bud of *B. simplex*, at another time to the matured bud of *B. Lunaria*, and only gradually assumes with its growth its distinctive character. It will be observed, however, that even in its youngest condition it is not only distinguished from the bud of *B. simplex* by the partially curved apex of the sterile portion, but by the significant development of the common stalk, that being by far the longest portion of the whole bud, whereas in *B. simplex* the common stalk is usually the shortest. In all such specimens that I have examined the common stalk in the bud of *B. matricariaefolium* has been more strongly developed than in either of the other species, and in any case, of these three species, in which the greatest difficulties and confusion occur, given specimens of an equal and corresponding growth, the buds will be found to be distinct and characteristic. Milde states, in his description of *B. matricariaefolium*, that the common stalk in the bud of that species is less developed than it is in the bud of *B. Lunaria*, but I have not found this to be the case. After reading over again his description I re-examined all of my buds, with the same result as before. I can only say that, in every examination that I have made, the appearances have been exactly as I have described them throughout these notes. On the other hand it is quite probable that Milde may have referred to the stoutness of the common stalk, as shown in its circumference, when speaking of its development, in which case my own observations would come nearer to his—though I have sometimes found the stalk in *matricariae-folium* to be as stout as that in *B. Lunaria*,—but I have construed the expression "developed" here to indicate the comparative length of the common stalk in the different buds.

The buds of all Botrychiums, with the single exception of *B. Virginianum*, are *imbedded* in the base of the stipe, as shown in figure 1.

In B. VIRGINIANUM, however, the bud is merely enclosed in a smooth upright-cavity at one side of the lower part of the common stalk, as shown in figure 2.

3
4
a
5
b
6
7
1
8
2
10
9

EMERTON

Heliotype Printing Co.

The special vernation of the different species is as follows :

In B. SIMPLEX both portions of the bud are straight, the fertile frond being enclosed within the folding sides of the sterile. The common stalk is the shortest portion of the whole bud and usually much less developed than in the other small species. The apex of the sterile frond is never curved, or bent over, but is always erect. Figure 3.

The doubts which have so long obscured this species are being gradually removed, and it will soon be universally recognized as a good species. Heretofore the German authors alone appear to have fully understood its true character, and it has long been placed by them on an independent basis. But, through the frequency of later discoveries, it is now becoming more familiar to our own botanists, and the time will come when it will cease to be a stranger to any herbarium. The species has been described at length by Milde in his Monograph on the Botrychiums, and figured by him in all of its forms in Nova Acta. Vol. XXVI. (1858) and more recently in my own paper published by Mr. Robinson, (1877).

In B. LUNARIA the apex of the sterile frond in the bud is always inclined, or bent over the nearly erect fertile frond in a hood-like manner. The common stalk is usually more strongly developed than it is in *B. simplex*, but not so prominently as in *B. matricariaefolium*, and the segments of the sterile frond are arranged very nearly perpendicularly. Figure 4.

This species continues rare within the limits of the Unites States, but the Syracuse specimens described in the TORREY BULLETIN for October, 1877, suggest the probability of its occurring more frequently than is generally supposed, and that some forms of it may have been confused heretofore with other species.

In B. BOREALE the apex only of the sterile frond is bent over inside (in *B. Lunaria* it is bent over on the outside) of the upper segments. The nearly erect fertile frond comes up between the lowest pair of sterile segments with its apex outside of but inclined toward the apex of the sterile frond. The segments of the sterile frond are arranged on an angle that exactly indicates its deltoid form in the living plant. (This may be understood better by referring to Emerton's figure, he having emphasized this point for me by a dotted line *a*, *b*, through the upper portion of the bud.) Figure 5. In consequence of this arrangement, the lower part of that portion of the bud composed of the two fronds bulges out and appears much broader than the common stalk.

I have not been able to obtain sufficient data to justify me in speaking of this species with any degree of confidence. The two specimens from Sweden in the "Davenport Herb." Mass. Hor. Soc., are the only ones that I have seen, and only one of these contained a bud. Reasoning, however, from analogy, it appears safe to assume that the figure given fairly represents the prevailing form of the bud in this species.

Milde does not give any special description or figure of the bud in this species, his only allusion to it being in his introductory chapter on vernation, where he speaks of a similarity in the vernation of

B. Lunaria, *B. boreale* and *B. matricariaefolium* with that of *B. simplex*, and makes the statement that in the three former species the tips of both the sterile and fertile portions are bent downward. This, however, does not agree with my examinations, nor with his own illustrations, as his figure of the bud of *B. Lunaria* clearly shows. In that figure the apex of the fertile frond is not bent down but fully agrees with my description and examinations. This species is credited to Unalaska (Milde) and so is included in our list of North American Botrychiums, but I do not know of any American specimens in this country.

In B. MATRICARIAEFOLIUM the apex of the fertile frond is bent downward in the bud toward the sterile frond, which clasps it with its side divisions and bends its apex downward over the whole. Figure 6. The common stalk shows a greater development than in *B. simplex*, or *B. Lunaria*, and this significant development indicates the relative position of the sterile frond in living specimens of these three species.

I have already remarked on the resemblance of the bud-form in this species during its earlier stages of growth to the matured bud-forms in *B. simplex* and *B. Lunaria*, but the tendency toward its described form may be detected from the beginning. In very robust specimens, both portions of the bud are sometimes too clumsy to conform exactly to the symmetrical arrangement of the typical form, but in all such cases the apex of both fronds turn downward in conformity with the proper arrangement.

In B. LANCEOLATUM both the fertile and sterile portions of the bud are curved and bent downward their whole length. The fertile frond is recurved and lies with its outer surface pressed close to the common stalk. The sterile frond is turned downward its whole length, its segments spreading over, and covering all of the longer fertile frond but the apex, which protrudes slightly beyond. Figure 7.

The bud-form in this species bears some resemblance to the bud in *B. Virginianum*, but its perfect smoothness and longer fertile portion are sufficient marks of distinction even if others did not exist. It is interesting to trace the development of the bud in this species from the beginning when a mere slit in its apex, and only a very slight curvature of the two portions indicates the direction in which it is passing to its true form.

In B. TERNATUM, and its varieties, the bud is very short and shaggy, the upper portion being so thickly covered with a hairy pubescence as to obscure the arrangement of the two fronds completely. This pubescence is wholly confined to the upper portion of the bud, the stalk remaining perfectly smooth. It is remarkable that in the huge California forms, some of which are nearly two feet high, and which, in part at least, belong to Milde's "*Forma Australasiaticum*," differing only in being less serrate, the buds are less shaggy, and the arrangement of the two portions may be seen more readily, but the plants themselves are more pubescent, and retain their pubescence longer than any that I have seen from other localities.

Milde states that in this species the apex of the fertile panicle is not only bent downward in the bud, but that the *tip is again bent* *upward*, being in fact sub-circinate, so that in his classification of the different kinds of vernation he places this species in a class by itself which he calls "vernatio sub-circinata." This, if correct, appears to me to be a most important point, as it would show a much closer relationship to the true order of Filices than is usually recognized in this genus, but I have not been able to verify it. The figure of the bud given by Milde does not in any way agree, either with his text, or my own examinations, and is a very unsatisfactory presentation of the bud as it really is ; yet I can hardly understand how so thorough and careful an investigator should be mistaken in so important a particular. I can only say that I have found the buds in this species to be precisely as I describe them. I cannot explain the arrangement of the two portions of the bud better than by saying that the fertile frond starts from the main stalk below the base of the sterile frond, folds its primary divisions inwardly, and turning downward its apex—the tip of which in the buds examined by myself I have found to be slightly curved inwardly but not again turned up,—lies close up to the inner surface of the main stalk, and that then the sterile frond bends down its own apex, over which it folds its upper divisions and continues to fold in the succeeding divisions, until the two lower primary segments clasp the top of the fertile frond. If one will close each hand separately, and then place both together so as to form a double fist, with the thumbs bent downward, inside, he will have a very good idea of the manner in which *B. ternatum* folds in the divisions of its two fronds, while the bent thumbs will very nearly represent the curved apex as I have found it, in my examinations. The buds for the second and third years are perfectly smooth. That for the second year shows a development quite similar to the bud in *B. Lunaria* for the first year ; that for the third year is too small to be clearly defined by an ordinary pocket lens. (Mr. Emerton's figure, No. 8, shows the position of the buds of two following years in the base of the first year's bud.) I give two figures of the bud in this species, figure 8 showing the arrangement of the fertile and sterile fronds, and figure 9 representing the natural appearance of the bud with its shaggy covering. Being still anxious to verify Milde's statement in regard to the apex of the fertile panicle in this species, I wrote to Mr. Robinson, requesting him to make some independent examinations with this object in view. The result has only confirmed my own observations. Still, unwilling to believe that Milde is in error, I would rather attribute our apparent disagreement to a want of properly understanding him on my part, and believe that the difference may yet in some way be satisfactorily explained. Mr. Robinson has also made some very interesting camera observations on longitudinal sections of that portion of the stipe containing the buds, from freshly gathered living plants of *ternatum-obliquum*, in which he traces the buds for 1878–79–80, and possibly 81, showing how well this genus provides for the growth of succeeding years.

In B. VIRGINIANUM the whole of the bud, including the common stalk, is more or less clothed with a hairy pubescence, but not sufficiently so to obscure the arrangement of the two portions, which are curved and turned downward their whole length in precisely the same manner as in *B. lanceolatum.* In this species, however, beside its pubescence, the bud is further distinguished by the longer sterile frond, the apex of which extends beyond and hides the fertile panicle. Figure 10.

I sum up the result of these notes in the following classification of the different kinds of vernation based on my own investigations, and append that of Milde for comparison. As the points of difference between us are independent of the general character and form of the buds themselves, the purpose for which I have brought forward these bud-forms is not affected by an apparent disagreement on other points, which further investigation on my part may wholly remove.

1. VERNATION WHOLLY STRAIGHT:

1. *B. simplex*, Hitch. Bud smooth. Apex of fertile and sterile frond erect. Figure 3.

2. VERNATION PARTLY INCLINED, in one or both portions.

1. *B. Lunaria*, Swz. Bud smooth. Apex only of sterile frond bent over and outside of the nearly straight fertile frond. Segments of sterile frond arranged nearly perpendicularly. Figure 4.

2. *B. boreale*, Milde. Bud smooth. Apex of sterile frond bent over inside of the nearly erect fertile frond. Sterile segments arranged on an angle. Figure 5.

3. *B. matricariaefolium*, A. Br. Bud smooth. Apex of both fronds turned down. Sterile frond clasping the fertile, with its apex overlapping the whole. Figure 6.

4. *B. ternatum*, Swz. Bud pilose. Apex of both fronds bent down with a slight curve inward. Figures 8 and 9.

3. VERNATION WHOLLY INCLINED, in the fertile frond recurved.

1. *B. lanceolatum*, Angstrôm. Bud smooth. Fertile frond recurved its whole length, the shorter sterile frond reclined upon it. Figure 7.

2. *B. Virginianum*, Swz. Bud pilose. Fertile frond recurved its whole length with the longer sterile frond reclined upon it. Figure 10.

Milde's classification is as follows:
" *Vernatio stricta.*" (B. simplex.)
" *Vernatio inclinata.*" (B. Lunaria, matricariaefolium and boreale.)
" *Vernatio reclinata.*" (B. lanceolatum and Virginianum.)
" *Vernatio sub-circinata.*" (Fertile panicle of B. ternatum.)

The importance of the bud-forms in Botrychia as a means for determining specimens, or as a help to a better knowledge of the genus cannot be overestimated. In the very youngest plants of the smaller species it will be safer, perhaps, to rely upon the unvarying character of the spores, when there are doubts in regard to their identity; but from the time when the buds begin to take upon themselves any form they will be found to be the best available means for determining specimens in all cases where the external characters are too uncertain to be relied upon. By their aid alone I have been able to place satisfactorily specimens that have long remained in a doubtful position. Among others, two specimens of *B. matricariaefolium*, which, on account of the unusually high position of the sterile frond, and their very acute segments, I had removed from my sheet and placed with *B. lanceolatum*, I have since been able to return to their proper place.

I have found on examining a great many specimens that in that wonderful species (*B. matricariaefolium*) the segments are often more acute than they are usually credited with being, and that the sterile frond is sometimes approximate to the fruit panicle as in *B. lanceolatum*, while in the latter species the sterile frond is at times placed far down upon the common stalk, so that it is extremely difficult, if not impossible, at times to distinguish them by their external characters alone: but their bud forms are invariably distinct.

Taking full grown specimens of *B. simplex* and *B. Lunaria* the general appearance of the sterile frond in each will sometimes be found to resemble the other so much, in the form of the segments, that it is difficult to understand why the apex should be bent over in one species and not in the other. Such, however, is the fact, and while it illustrates nature's methods in preserving her marks of distinction between species otherwise similarly related, aud furnishes us with reliable characters by which to distinguish them under different conditions, it also proves very clearly, to my mind, the distinctive character of the different species of Botrychia.

BOSTON, NOV., 1877. GEO. E. DAVENPORT.

NOTE.—The figures with which these notes are illustrated have been drawn by Mr. J. H. Emerton, directly from the buds furnished to him for that purpose by myself. Nos. 1 and 2 are of natural size; the proportions of the others have been enlarged to give more distinctness to the parts. G. E. D.

§ 208. **Camptosorus rhizophyllus,** Link.—It is with pleasure that I inform you of the discovery of Camptosorus rhizophyllus in this vicinity, and within 14 miles of Boston. It was found growing on a rocky knoll near the banks of the Charles River, and, as it has never before been reported this side of Mt. Tom, in the western part of the State, its presence here will be received with rejoicing by the many lovers of ferns in this quarter. WM. EDWARDS.

SOUTH NATICK, Dec. 17th, 1877.

§ 209. **Pringle's Plants.**—We recently, § 193, called attention to Mr. Chas. G. Pringle's sets of Alpine, Sub-alpine, and Northern plants of New England, which he offers for sale at ten cents a specimen, or, we believe, for exchange. We have, however, lately received such an endorsement of them from good judges, that we deem it for the interest of our readers to repeat the notice. One correspondent writes: "I received on Saturday a set, and never before knew what good specimens from that region looked like. The color is kept, the specimens are collected root and all, are furnished with very handsome labels, are liberally supplied, the exact date of collection both of flowers and fruit is given, and locality, and all species so requiring have both states represented." Address Mr. C. G. Pringle, Charlotte, Vt.

§ 210. **Chicago Botanical Garden.**—We are very sorry to learn that this promising enterprise has come to an untimely end. The Managers had solicited contributions from the principal Gardens of the world, promising to make suitable returns as early as possible. The total number of packets of seeds and living plants received up to July 1, 1877, was nearly 15,000; the number of similar packets returned, about 5,000; the number of species under cultivation in the Garden, over 6,000. Nevertheless, the Board of Commissioners voted in July, on account of the expense, to terminate the operations of the Garden, and place all its plants, seeds, etc., under the charge of the General Superintendent of the Park. The Managers, supported by many citizens, sought in vain to have the matter reconsidered. They are, therefore, rendered powerless to fulfil the promises made with the sanction of the Commission.

§ 211. **Botanical Gazette.**—The January No. of this publication, being No. 1 of Vol. III., justifies the editors' determination to make the "Gazette" indispensable to botanists. The editors are John M. Coulter, Hanover, Ind., and M. S. Coulter, Logansport, Ind. It is published monthly, at $1.00 a year, and is to be illustrated when necessary. It is nicely printed on tinted paper, and consists of 8 pages, larger than those of the BULLETIN. In the January No. we find the description of a new species of Isoetes, by Dr. Engelmann, *I. Butleri*, found by Mr. George D. Butler, in Indian Territory, along with *I. melanopoda*, J. Gay, a new locality. Dr. Chapman contributes a long list, to be continued, of plants chiefly from the semi-tropical regions of Florida, which are either new, or which have not hitherto been recorded as belonging to the Flora of the Southern States. Several of them have been noticed before in different publications; some in the BULLETIN, *e. g.*, *Pavonia spinifex*, Cav., Vol. V., § 95, but it is a great advantage to have the new plants brought together in one list. There are also other notes of interest.

§ 212. **Asplenium ebenoides,** R. R. Scott.—Did you know how proliferous this species is? I saw a plant lately, in J. Warren Merrill's greenhouse at Cambridgeport, on which there were four fronds having little plantlets starting from the apex—one of them large enough to be potted. Mr. Merrill told me that he has propagated it by this means. He has several plants growing and fruiting finely, and showing remarkable variations. G. E. D.

[Have plants ever been raised from the spores?—EDS.]

§ 213. ERRATA.—Fresh-water Algae, p. 188, 59, POTEROPHORA, l. 4, dele "in"; l. 3, for "consistentia" read "instructa"; l. 6, for "constructis" read "instructis"; p. 190, under ARCHIDIUM DONNELLII, l. 5, for "Hampden Co." read "Hampden Sidney College, Prince Edward Co."; p. 192, § 203, l. 4, for "*A. minutum*, Englm." read "[*A. minutum*, Englm.]"; l. 10, for "Rhyncospora" read "Rhynchospora".

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*, 25 *cents. Address*, WM. H. LEGGETT, 54, *East 81st Street, New York. Money Orders on Station K, P. O., N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* DR THURBER, *the President of the Club, may be found at* 245 *Broadway.*

§ 214. **Opuntia Ficus-Indica,** DC.—It may not be out of place to note a few things about the Opuntia Ficus-Indica, of Southern Italy and other Mediterranean countries. Its main use in the Orient appears to be first to serve as a hedge, and next to furnish food. In Cyprus I have seen it in thickets of considerable extent. When used to make a hedge, joints of the stem, which people generally call the leaves, are stuck in the earth in the fence line; often on the top of a stone wall; and sometimes merely laid on the ground. It is sure to grow; hardly anything seems to destroy its vitality. In late winter, or early spring, the stem sends out its buds, or stem-joints, which soon assume the familiar spatulate form, and are, from the start, covered with the appressed bracts or leaves. These bracts disappear soon after the new stem-joint has acquired firmness and shape, and never appear again, except when the joint so formed sends out new ones. They are replaced by spines, often, if not generally, an inch and a half long; two or three to five or six in a whorl or nodule; which make the hedge impassable to anything from cavalry to chickens. Yet not only camels but the Syrian goats feed on the green stem-joints, disregarding the spines; and I have now and then seen a donkey eating them, too. The new stem-sections or joints appear normally along the larger end of the spatula, but by no means universally so. Frequently one or more will start from the middle of the flat side; and these new ones will in time put forth others, in all positions and directions; so that the Opuntia growth is always a curious and novel sight.

The stem-sections vary greatly in size, but generally reach a foot or more in length, and eight to ten inches in breadth, with a thickness of an inch to an inch and a half. I have rarely seen a section two feet long, and two inches thick. I refer now to the sections when young and green.

The structure of the young stem-section appears much better in this great Opuntia than in the O. Rafinesquii of this country. First is the cutis, which I have often peeled off by using a little care, and which is white in itself. Underneath is a firm layer, filled with chlorophyll, about an eighth of an inch deep, and then the vascular body, of a much lighter green. The whole is extremely succulent, so much so that one smashing the joints with a stone often gets spattered with the juice. When a section is dead, and the inside decayed out, the cutis often remains like a bag of fine, stiff parchment, and rather tougher than paper.

Regularly, when a section has put forth new ones, and these new ones again, it stiffens up to bear the added weight and leverage. This it does by increasing in size in all directions, but chiefly in thickness, and at the same time becoming woody. The woody fibres are a loosely, and somewhat tangled reticulated mass; which become more numerous, somewhat finer, and firmer, with age and size. The lower joints gradually become quite round and cylindrical, the weaker branches give way to weight or accident—the wind and other causes breaking off the little joints—and the whole plant becomes a tree, with a stem from eight inches to a foot and a half in diameter, having lost its light green color, and assumed a common brown, suitable for tree trunks. The roots become large, and spread widely. The trunk, however, always shows the sutures of the original sections; though one could hardly believe, at first sight, that they were all once green, juicy, flat and spatulate, like the new sections. The tree thus formed is from about seven to nine feet high; but I have seen one or two as much as fifteen. A few of them will stand together; and when over-run by the pendent smilax of the country, the long-suckered rubus, and sheltering beneath it the crocuses of different hues, with the "wee, modest, crimson-tipped" daisy, and the singular arums, present a very pretty sight. But the whole tangle is a fearful place to get against—to get into it is next to impossible.

The flowers come out on the edges and flat surfaces (principally upon the edges) of the stem-sections, in spring; the ovary being nearly as large when the flower appears, as afterwards, when it becomes ripe fruit. The flower above the ovary is very nearly of the same size and appearance as that of O. Rafinesquii, but with the yellow, shades of orange and even pink now and then appear. The ovary and fruit are much larger; but as one can see the fruit for sale in New York (rather small specimens), I will not describe it, except to say that it is furnished with the troublesome bristles, in whorls or nodules, like the stems of O. Rafinesquii; and that for eating, it is a little cooling, but too full of seeds for comfort; very commonly eaten, by the poorer classes especially, and very cheap. The fruit is generally gathered by women and children, who use for the purpose a long pole with a sharpened nail, with which last they pierce the fruit and thus pull it off. It is shaken or rubbed around in a bag or basket to get off the bristles.

Before the flowers are open, they have inside a plentiful sweetish moisture, and are visited not only by ants, but by a peculiar insect which I cannot well describe, being no entomologist; but this insect I never failed to find in the imbricated, twisted perianth, *before it began to open;* after the least opening at the top, the bug was gone. Such I found to be the case with every flower I tried, without one exception. I tried, probably, some thousands; for I made it a business to do them by hundreds, morning after morning.

The number of flowers on an ordinary joint was about twenty; rather more than less. Now and then there would be many together with from ten to eighteen; but not infrequently I have seen over forty on a joint; the largest number I remember was fifty-two. One can thus imagine the quantity of fruit in a hedge seven feet high, with the stem-joints so close together that a hen could not get through.

I. H. HALL.

610, CHESTNUT STREET, PHILADELPHIA.

§ 215. DEAR MR. EDITOR:—Considering that your worthy CLUB bears the name of that venerable man and scrupulously conscientious botanist who disliked most of all hasty and inconsiderate publication of genera and species, may an old botanist advise some younger ones to make haste more slowly? In particular, the proper determination of low *Algae* and *Fungi* requires not only critical study of many forms with the best appliances, but also a good acquaintance with the literature of the subject at first hand.

It is not my vocation to look after Cryptogamic botany, and I am sincerely desirous to avoid giving offence. Yet I will venture a few remarks upon Mr. Wolle's papers on Fresh Water Algae.

"The late Dr. M. G. Thuret" was not a Doctor, and his name was Gustave Thuret: the M. stands for Monsieur or Mr.

When specimens sent, through a friend, to M. Thuret's surviving associate, Dr. Bornet, were determined by the latter, a reference to this might not be amiss; and such as were pronounced on such authority too poor for identification might well have been let alone for the present.

Gleocapsa Itzigsohnii being a MS. name communicated by Bornet, this might have been mentioned.

"*Vibrio Rugulo*" is a mistake for V. Rugul*a*; "*Chthonoblastus Vaucheria*," for *C. Vaucherii*. "*Pleurococcas minuatus*," we may suppose means Pleurococcus miniatus, with a mere misprint in the generic name, the specific name turned into something unmeaning. "*Chlorococcum humilicola*"—a dweller upon something humble!—stands for C. humicola, an inhabitant of the ground, and the genus is *Cystococcus*.

"*Polyedron*" is Polyedrium of Nægali.

The new species of "Conferva," with such characters as are given, and with no indication of what this genus is taken to contain, cannot be deemed valuable contributions to Phycology.

"Hassel" is a name which does service for Hassall.

"*Bulbotrichia Onokoensis*" is founded on the young thallus of a Lichen.

"*Chlorococcus rubrapunctus*, n. sp.," has the name of the species somewhat wonderfully made.

Lingbya: For a species we have "L. Cincinnati," from Colorado. Does this stand for *L. cincinnata?*

"*Scytonema badium*. . . . This plant has somewhat of an indefinite character, not unlike *Sc. truncicola;* sometimes it assumes the characters of a "*Tolypothrix*." It may well be likened to both, as it is *Tolypothrix truncicola* of Thuret. "*T. Bulanheimii*" is a lapsus for Bulnheimii, Rabenh.

"*Kalodictyon*" and "*Poterophora*" are new genera, supposed to be Algae (and the first probably is something of the Cladophora sort), but without proof of it, or fructification. They are, therefore, lumber.

The third part has Latin instead of English characters, upon which some comments might be made; but they might seem captious.

On p. 190, Mr. Austin's fine powers of discrimination, so extensively shown in the Mosses, are brought to bear again upon our common grass, *Danthonia spicata*, and *D. Faxoni* is made upon what the collectors and the specimens assure us is a mere form of the original species, maturing at about the same period.

A. GRAY.

§ 216. **The excentricity of the pith in Rhus Toxicodendron.**— If we examine a cross-section of the stem of the Poison Ivy, we soon find that the excentricity of the pith is due to both the greater number of cells on the supported side and their larger size. The ducts particularly are much larger on the supported side, while there is no such marked difference in reference to the prosenchymatic wood-cells. In the sections on my slides the average diameter of the ducts on the smaller side is .04 m. m., while on the larger side it is .11 m. m. The prosenchymatic wood-cells measure on both sides from .013 to .014 m. m.

As the lateral rootlets undoubtedly play an important part in the life of our plant, I examined a considerable number of sections from such places where those roots are inserted in the body of the stem. None of them are merely superficial, but they all arise more or less deeply in the stem, at the outside of some layer of the fibro-vascular bundles, piercing, therefore, both the concentric circles of the cambium and the phloem or bast layers. Their ends within those woody tissues are conical or club-shaped, often bottle-shaped, and they are firmly wedged in between the wood-cells and ducts. Invariably one of the medullary rays terminates at the extremity of the rootlets. They are formed, as all roots, of some outer layers of wide, thin-walled, parenchymatic, and of a body of long, prosenchymatic wood-cells, with dotted ducts among them; but I could not find any pith. The outer layers of their cells are in close connection with the adjoining cells of the stem, which they meet at different angles. This connection can be noticed very plainly, especially on longitudinal sections parallel to tangents.

After this short anatomical examination we are perhaps better prepared to discuss the physiological question. What makes the woody tissues nearest the support of the plant grow so much more vigorously than those on the opposite side?

Before trying to answer this question, allow me to state briefly, what our best authorities, such as Dr. Jul. Sachs, think about the process of cell-growth in general. No cell can grow, unless it is sufficiently supplied with water. But here we have to distinguish between cells with perfectly closed, usually thin walls (such as probably all young cells have), and cells whose walls are perforated (for instance, ducts). In the first case, the water, by endosmose, enters the lumen of the cell and completely fills it. But the endosmotic force not only fills the inner space of the cell, but causes a powerful tension of its walls, the so-called turgor. This turgescence cannot take place without removing the molecules, forming the cell-walls, from one another, and it is at this stage that particles of new matter, kept in solution in the water, are deposited between the molecules, so that afterwards, even when the turgos subsides, the cell retains its greater size. In cells with perforated walls there can, of course, be no turgescence, and here it is the imbibition of water by the thick cell-walls themselves that makes them turgid, whereupon, as in other cell-walls, interposition of new material causes the growth of the cell.

If we accept this theory, and I think we must, for want of one more plausible, we have to believe, that without turgescence or imbibition there is no growth, and that, the more intense they are, the more rapidly the increase takes place—in other words, seemingly a very trivial result, the more water is supplied to a cell, other essential conditions of course being alike, the larger will it grow.

Now, if we agree upon this, in the case of Rhus, I think it is very natural to suppose, that the tissues on the supported side must be better supplied with water than the others. (I say with *water*, not with nourishing sap, generally.) This more abundant supply of water would explain the greater activity of the cambium-cells in forming new cells, as their turgescence would be so much more intense, than on the opposite side, and it would also account for the extraordinary growth of the ducts by the increased facility for imbibition.

But where is that increased supply of water to come from? Why, nothing prevents the lateral rootlets from acting as water-carriers; they start from and are in close connection with the prosenchymatic wood-cells and the ducts, the very tissues whose principal function it is to convey the water to such places where it is needed.

The only question is: Have those rootlets any water to carry? or, Where do they receive it from? I have examined several hundred plants of Rhus toxicodendron growing on trees. Of the first one hundred I kept accounts for the individual plants. An overwhelming majority of them grew on the east, north-east, north or north-west side of the trees. A remarkably interesting object is a long, old wall near the R. R. station, at Grinnell, on L. I., which runs from north to south. While on its east side the wall is so covered up by the most luxurious growth of Rhus, that hardly a brick can be seen; the west side can boast only of a very few stragglers. Besides, I noticed very many plants that started from the ground, on the south side of trees. After a very short trip upward on that side, the stem would turn either west or east, and finally ran all the way up on the north side.

Now it seems to be evident, that in these cases the stem wound its way to such places, where its rootlets could find most moisture in the cracks and recesses of the corky bark, and that is, of course, on the most shady side, the same that is so much preferred by cryptogamic plants, which seem to know, too, that the atmospheric moisture is retained there longer and in greater quantity.

I will just mention another observation bearing upon this point. In places where Rhus abounds, I found none growing on the smooth bark of beech-trees, while the oak, hickory and liquidambar of the same locality were well patronized.

In conclusion, therefore, I venture to say: If we adopt the present theory referring to turgor and imbibition, and if it is true that the Poison Ivy thrives best in places where its lateral rootlets will find most moisture, cæteris paribus, we must suppose, that the excess of moisture supplied to the tissues of the supported side by the rootlets is the chief, if not the only, cause of the astonishing increase of the cells in number and size, and finally of the excentricity of the pith.

I have somewhat lengthily dwelt upon this subject, because some of the observers, whose opinions were published, seemed to be inclined to believe in the parasitic nature of the lateral roots, while others sought to maintain that they do not contribute to the plant any nourishment whatever. JOS. SCHRENK.

COLLEGE POINT, Jan., 1878.

§ 217. **Camptosorus in Eastern Massachusetts.**—The discovery of Camptosorus in Eastern Massachusetts would indeed be an event that all lovers of ferns would hail with joy, but the question that will come first to every one will be,—Is it indigenous, and to what extent?

The species is one that is considered as peculiar to limestone regions, and is usually sought for in those regions alone, although it is not always found growing on limestone rocks. It has, however, always been confined to the limits of a prescribed range, out of which it has seldom, or never been found growing naturally.

That it should have been discovered in a locality so far out of its known range, in a comparatively level country, and in a town where no lime rock occurs, with no intermediate stations between it and its western habitats, would be surprising indeed, if it could be shown that it was really indigenous there. If such were the case, we might expect, from the very proliferous nature of this species, to find it in considerable quantity, but we do not. There are only three or four of the principal plants with a few small plantlets growing in the crevices of the rock.

Having recently visited the locality in company with Mr. Storrow Higginson, who discovered it, I can verify the presence of the species there, but feel compelled to record my conviction that it is not indigenous, first, because the few plants there are of a weakly growth, and do not manifest sufficient vitality to render it probable that they are growing there naturally; second, because the locality is altogether too far out of its known range with no intermediate stations; and lastly, because the whole conformation of the surrounding country is opposed to it.

How then came the plants there? Mr. Higginson's theory is that the spores had been wafted by the wind from the mountainous regions, and regards it as an interesting incident in the migration of plants. If this is correct then we may expect to hear of other localities being discovered in the "path of the wind."

My own theory is that the plants have originated from other plants set out there at some time under favorable conditions, and have propagated either from spores blown into the crevices, or by means of the rooting apex of mature fronds.

That plants of this, and other species have been placed in out of the way places in the vicinity of Boston by different botanists I know, and have no doubt the recently discovered Camptosorus, so near to Boston, originated in this way.

Be this as it may, the plants are there growing quite naturally, and propagating themselves, as the little plantlets testify, and I sincerely trust that no one, who may chance to come upon them will ever disturb them, but regard the locality as something sacred.

BOSTON, MASS., Jan., 1878. G. E. D.

§ 218. **Drosera longifolia,** L.—In comparing *D. longifolia*, L, collected in Germany with *D. longifolia*, L., described in U. S. Manuals, I get somewhat confused. What these call *D. longfolia*, L., is *Drosera intermedia*, Hayne (*D. longifolia*, Smith), of German botanists. The D. longifolia, L., of German Manuals (D. anglica, Huds.) has a scape from 5 to 8 inches high, erect (that of *D. intermedia* is ascending), twice as long as the lanceolate, wedge-shaped leaves. The whole plant, not uncommon in marshes of Europe, is more robust, has larger flowers than *D. intermedia*, Hayne, and stands in aspect between this and *D. rotundifolia*. On sending a specimen of D. longifolia, L., collected in Germany to our leading botanist, Professor A. Gray, of Cambridge, and asking for information, I received the following answer:

"In Torr. & Gray's Flora and my Manual the old English view was adopted. We are now taking the German view as on the whole best, and have done it in Bot. Californ. We well know the species. The question related to the names they should bear, Linnæus having mixed them."

Having not at hand the Species Plantarum of Linnæus, I would only remark that the name of Linn. for the *D. longifolia* of U. S. Manuals is a very bad one. The true *D. longifolia*, L., of Europe has not yet been found in this country. The name *D. longifolia*, L., must, therefore, be changed into *D. intermedia*, Hayne, (*D. longifolia*, Smith.) I will send *D. longifolia*, L., of Europe, to any one sending me *D. linearis*, Goldie, *D. brevifolia*, Pursh., *D. capillaris*, Poir.

J. H. WIBBE.

OSWEGO, N. Y.

§ 219. **Publications.**—1. *American Journal of Science and Arts*, Jan.–Mch: Dr. Gray notices at some length Darwin's "Different Forms of Flowers." Mr. Darwin adopts the term *heterostyled*, but Dr. Gray still insists on the greater fitness of his term *heterogone* or *heterogonous*, which indicates that the difference is in the stamens and pistils, and avoids the erroneous implication that the style is only or mainly concerned. He thinks that in systematic botany, we shall hereafter write, *Flores hermaphroditi*, *heterogoni*, *monoeci*, *dioeci*, *gyno-dioeci*, *polygami*, as the case may be. To the list of cleistogamous flowers, founded on Kuhn's list, are added in this notice Mr. Pringle's recent discoveries of this character in *Dalibarda repens*, *Danthonia spicata*, *Vilfa* and other grasses. Dr. Gray diminishes the list of genera, reducing *Ruellia*, *Dipteracanthus* and *Cryphiacanthus* to one genus, but leaves the cleistogamic character of Lechea unquestioned; but who has observed it? In a "*Supplementary Note*" in the Mch. No., Gentiana Andrewsei is again discussed in reply to Mr. Meehan's note, BULLETIN, § 198, and Mr. Meehan's observations on *Linum perenne* from Colorado are thought to show that this *L. Lewisii*, Pursh, is after all a distinct species. Another notice of special interest relates to Parkman's *Hybridization of Lilies*, in the Bulletin of the Bussey Institution, Vol. II., No. 15. Mr. Parkman finds after a series of very careful experiments, that in the genus Lilium the hybrid offspring, in 40 out of 50 cases, takes almost all its traits from the female parent, and in not a few instances all. A friend suggests that hybrid tulips and hyacinths have to be cultivated a number of years before they *break*, as it is termed, and show their mixed origin; perhaps Mr. Parkman's lilies would break if cultivated long enough. In the Feb. No. Sereno Watson gives an incomplete synopsis of the species of *Populus*, for the purpose of calling the attention of botanists during the coming season to this still very imperfectly-known genus. Flowers and fruit, even of the common species, are too rare in collections, and are much needed for their satisfactory definition. We have not space for other matters of interest noted by Profs. Gray, Goodale, Farlow and Eaton. The Journal, however, is, or ought to be in the hands of all who want to know what is doing in the botanical world.—2. *American Naturalist*, Jan.–Feb: This monthly is now published in Philadelphia by McCalla and Stavely, under the editorial management of Dr. A. S. Packard, Jr., and Prof. E. D. Cope. There is in the Feb. No. an article on the "Distribution of Timber and Origin of Prairies in Iowa." The writer, Prof. J. E. Todd, insists that the *constancy of the humidity of air and soil* is the most important factor in the formation of forests.—3. *Ferns of North America*, by Prof. Daniel C. Eaton, Parts I.–III., S. E. Cassino, Naturalists' Agency, Salem, Mass., one dollar a part. The work is issued in large quarto parts, at intervals of about two months, which is as fast as the plates can be prepared. It will require about twenty parts to complete the work, in the course of which every species known to inhabit the United States will be figured. The artist is Mr. Emerton, and the editor has the aid of the most eminent pteridologists. The plates are printed in colors. The three numbers of this beautiful and valuable work thus far published, contain nine plates, finely and fully illustrating sixteen species, viz.: Lygodium, palmatum, Swartz; Cheilanthes Cooperae, Eaton; C. vestita, Swartz; C. lanuginosa, Nutt.; C. Californica, Mett.; Asplenium serratum, L.; A. ebenoides, R. R. Scott; A. ebeneum, Aiton; A. pinnatifidum, Nutt.; Botrychium Lunaria, Swartz; B. lanceolatum, Angström; B. boreale, Milde; Aspidium Noveboracense, Swartz; Camptosorus rhizophyllus, Link; Notholaena Fendleri, Kunze; N. dealbata, Kunze. The illustrations represent the whole plant and such details as are necessary to understand the venation and fruitification, are beautifully and naturally colored, and choice specimens. The letter press gives not only the scientific description and synonomy, but also an account of the allied plants and much matter of interest in regard to distribution, localities, habits and other details. The lovers of ferns are fortunate in the opportunity here offered to them.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.–V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club.* 25 *cents. Address*, Wm. H. Leggett, 54, *East 81st Street, New York. Money Orders on* **Station K**, *N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* Dr Thurber, *the President of the Club, may be found at* 245 *Broadway.*

§ 220. **Plants of Western Iowa.**[1]—We owe an apology to the Rev. Robert Burgess, of Ames, Iowa, for delay in publishing a note on deficiencies in Arthur's Catalogue of Iowa plants. The note is now rather out of date, but we subjoin a list of the plants sent us, as well as we could make out from the specimens, which were not always perfect enough for a satisfactory determination. We have appended a query mark to those about which we were doubtful: 1. Cynthia Virginiana, Don.—2. Coreopsis lanceolata, L.?—3. Parnassia Caroliniana, Mchx.—4. Linaria Canadensis, Spreng.—5. Arenaria Michauxii, Gray.—6. Viola pedata, L.—7. Salix tristis, Ait.—8. Cyperus inflexus, Muhl.—9. Alopecurus geniculatus, L.—10. Synthyris Houghtoniana, Benth.—11. Cypripedium parviflorum, Salisb.?—12. Ammania latifolia, L.—13. Polygonum incarnatum, Ell.—14 Aster Tradescanti, L., *var.* fragilis.??—15. Osmunda Claytoniana, L.—16. Festuca nutans, Willd.—16 *bis.* Festuca elatior, L.—17. Senecio canus, Hook.?—18. Lespedeza hirta, Ell., *var.* sparsiflora, T. & G.—19. Valeriana edulis, Nutt.—20. Arabis lævigata, DC.—21. Arabis hirsuta, Scop.—22. Trifolium reflexum, L.—23. Cerastium viscosum, L.—24. Lechea, a strict form which seems peculiar to the region about the Upper Mississippi.—25. Salix discolor, Muhl.—26. Potamogeton fluitans, Roth.?—27. Hypericum Canadense, L., *var.* major.—28. Menyanthes trifoliata, L.—29. Hemicarpha subsquarrosa, Nees.—30. Physalis Philadelphica, Lam.?—31. Physalis pubescens, L.—32. Plantago major, L.—33. Euphorbia glyptosperma, Eng.—34. Euphorbia serpyllifolia, Pers.?—35. Cyclachaena xanthiifolia, Fres.—36. Artemisia Canadensis, Mchx.—37. Poa annua, L.—38. Cyperus diandrus, Torr., *var.* castaneus.—39. Sporobolus cryptandrus, Gray.

§ 221. **Growth of Exogens.**—The accepted theory of growth in the stems of Exogens, especially in the regions of frost, is that during the period of foliation great activity goes on in the movement of the fluids throughout the plants structure, and that during that season of activity a new *tube* of wood is formed around the stem; that this new formation is marked by vascular tissue on the inner surface, and by a more dense and compact tissue on the outer surface.

On cross sections of most Exogenous stems, this tube is distinctly marked by the different tissues which make up the new formation. This new tube of wood is believed to be the result of one season's growth. In the regions of frost this season is the period of foliation.

Hence each marking is made by a period of great activity and a period of repose, constituting in the regions of frost an entire year.

Why this tube should have on its inner surface a lining of porous structure, while the outer layer is composed of tissues whose structure is more dense, has not been explained. It has been suggested that, during the months of February and March the outer layer of bark is reptured in the direction of the axis of growth, and hence offers little resistance to the expansion of the cambium which results from the large deposits of cell material. Under this slight pressure the

[1] Central J. see p. 260

vascular tissues form, while, later in the season, the space between the bark and wood becomes more and more crowded, the cell material is all the while subjected to increasing pressure, and the tissues formed later spread out in the direction of the circumference of the stem, are hence greatly flattened, and the bore so reduced as to present a more dense appearance.

That there are some plants among Exogens that do not present a distinct marking, and some that have none whatever, does not disturb this general theory of growth. Such cases may be set down fairly and properly as unexplained exceptions. On the other hand that there are Exogens that do constantly form two or more tubes of wood in a year does not refute the theory. I have laid upon the table here, this evening, specimens of Exogenous stems which have made from five to ten distinct separable rings in one season. The Beet has been brought up here as an instance of the formation of more than one ring in a year. But the whole order Chenopodiaceæ, with Amarantaceæ and other allied orders are subject to these phenomena, and I think these exceptions are far more numerous than is generally supposed.

What we wish to get at, however, is this: Is it true in general, that our Exogens may, and frequently do, form more than one distinct tube of wood in one year?

If the formation depends upon two conditions, viz: a period of activity and one of repose, then it would be logical to infer that a ring of wood may be formed, whenever, and as often as, these two opposite conditions succeed each other, and that the rings, or tubes, would be more or less sharply distinguishable, as those periods were sharp in succession For example: if, after the the middle of July, a severe drought should come on, accompanied by much high wind, and should prevail till the end of August, and this drought be succeeded by a very warm and wet September, I believe that two distinct tubes of wood would be made by most of our Exogens, and that these rings would be so sharply distinguishable as to seem like two years' growth

There are other circumstances generally present that may make two or more markings in one year, not so sharply distinguishable.

My attention was first drawn to this subject by the examination of a potatoe, which had made what the farmers call a second growth. It was after a severe drought had been succeeded by a wet season, and potatoes took on a new layer which more than quadrupled the size they had attained previous to the wet period.

I have examined many stems, and find that the Beet, Chenopodium, Amarantus, Atriplex, and other genera of these and allied orders are constant exceptions to the accepted theory.

From my observations I infer that the Magnolia glauca makes two or more rings of wood in a year. I have noticed that the Magnolia puts forth three distinct sets of leaves in one year. The first crop appears in May; in the course of about three weeks another very distinct crop appears; the third appearing late in June. In the intervals there must be a considerable amount of cell material diverted from wood structure to leaf building, and the growth of the stem must be arrested. When the new crop of leaves are mature, they will begin again to throw down large quantities of cell material, and the lining of a new tube will be commenced. During these alternations, different sorts of tissues are necessarily formed, and the markings on a cross section have the appearance of indistinct rings.

The Robinia is another notable example of this. I have laid upon the table a specimen of an eight year old stem, upon which may be counted nine distinct rings and many indistinct ones. It was cut in June, and two distinct rings had already been formed, one made up of the cells that were forming the inner lining of the new tube of wood, and the other made up of the bast cells, forming the new layer of bark. It will be found on a close examination of the section, that the greater vessels are arranged in concentric layers of bundles not in contact, making imperfect or intermediate rings. These bundles are so mingled with the woody tissues as so give the layers in some degree a homogeneous appearance, entirely wanting in most stems.

As has been stated, the accepted theory of Exogenous growth is, that a new tube of wood is annually formed outside the last year's growth. This theory is based upon well authenticated observation, and no theory in Natural History is admissible, unless it is born out of observation and experiment. I do not presume to offer a new one, yet I believe that the old theory will yet undergo great modification, as more light is thrown upon this interesting question. I do not hesitate to say that from my observations I am forced to the conclusion that, as Exogens require a period of activity and a season of rest to form a tube of wood, they may and do form new tubes whenever these conditions sharply succeed each other.

O. R. WILLIS.

§ 222. **Botanical Directory for 1878.**—Parts I. and II., containing the names and specialties of Botanists, are now ready for distribution. Part III., relating to Libraries, Herbaria, etc., will probably be ready in May, when it will be forwarded to subscribers.

§ 223. **When the Leaves fall.**—Mr. N. L. BRITTON, of New Dorp, Staten Island, has kindly sent us the following excellent contribution to this subject. Mr. Britton observes that "the female in dioecious plants appears to hold its foliage longer than the male." He has "noticed this very strongly marked in Ailanthus glandulous, Acer saccharinum and A. rubrum, and Salix alba and S. discolor, but not in Populus. Ilex opaca and Kalmia latifolia hold green leaves all winter."

For want of space we have left out two columns of Mr. Britton's tables; the first, for September 29th, when the leaves were all on the plants mentioned except those marked with *, and the last, for November 30th, when all the leaves were off except those marked †. Of the former Cephalanthus had already lost all its leaves, September 29th, the others only a few of them; of the latter, Myrica cerifera still held most of its leaves, November 30th, Quercus palustris had still a good many leaves, the others had still a few, and Baccharis had still some at Christmas.

	OCTOBER 6TH.	OCTOBER 14TH.	OCTOBER 21ST.	OCTOBER 28TH.	NOVEMBER 4TH.	NOVEMBER 11TH
1. Liriodendron		Many off		Nearly all off	All off	
2. Ailanthus.*	Many off	Nearly all off male. More on fem.	Nearly all off on both sexes.	All off		
3. Rhus glabra		Begin to fall	Falling	do.		
4. Rhus copallina	Some off			All off on some trees	All off	
5. Rhus Toxicodendron	All on	All on, but very yellow.	Falling	Nearly all off		All off
6. Vitis Labrusca			do.	do.	All off	
7. Vitis cordifolia.*		Nearly all off.		All off		
8. Ampelopsis	Very red		Falling a little	do.		
9. Celastrus scandens	Turning		Begin to fall		Falling fast	A few left †
10. Euonymus atropurpureus			Nearly all on	Falling	Nearly all off	
11. Acer saccharinum.*	Falling	Nearly all off on male but fem. still leafy.	All off			
12. Acer rubrum		Nearly all on, but very red.	Falling	Nearly all off	A few left	All off
13. Negundo aceroides		Some falling	All off			
14. Robinia Pseudacacia			Falling		Nearly all off	All off
15. Wistaria sinensis			Nearly all on			†
16 Gleditschia triacanthos		Begin to fall	Falling	Nearly all off	A few left	All off
17. Prunus serotina	Some fallen		Nearly all on	Falling	Nearly all off	do.
18. Prunus Cerasus and *vars*.		Falling a little	do.	do.		Many still on
19. Rosa Carolina and lucida	Some fallen	Half off	A few left		All off	
20. Amelanchier			Falling		do.	
21. Hamamelis			do.	Falling	do.	
22. Liquidambar	Turning	Some falling	Falling fast		Nearly all off	All off
23. Cornus florida	Falling				All off.	
24. Nyssa multiflora					Falling	A few left
25. Sambucus Canadensis		A few off	Some left	A few left		
26. Viburnum prunifolivm			Falling		A few left	All off
27. Viburnum dentatum	Begin to fall	Falling		Nearly all off		
28. Cephalanthus.*						
29 Baccharis halimifolia		Falling a little	Falling			Nearly all off †
30. Vaccinium corymbosum			Nearly all on		Falling	All off
31. Ilex verticillata			Falling		A few left	do.
32. Catalpa		Begin to drop	do.		Nearly all off	do.

	OCTOBER 6TH.	OCTOBER 14TH.	OCTOLER 21ST.	OCTOBER 28TH.	NOVEMBER 4TH.	NOVEMBER 11TH.
33. Paulownia	Dropping			Nearly all off	All off	
34. Lilac. [Syringa.]				Falling		
35. Sassafras	Very red	Some falling		Nearly all off		All off
36. Laurus Benzoin		Begin to fall	Falling fast	All off		
37. Ulmus Americana.*	Many off		Nearly all off	A few left.	All off	
38. Ulmus campestris			Falling			A few left
39. Celtis occidentalis	Some falling	Very yellow	Falling fast	Nearly all off	All off	
40. Morus rubra	All on, but very yellow.	Some falling		Falling fast	Nearly all off	
41. Platanus	Nearly all off some trees, all on others.			Many on yet	do.	All off
42. Juglans nigra	On some trees all off, on others all on.		All off			
43. Carya alba	All on	Begin to fall	Falling	Nearly all off	All off	
44. Carya tomentosa	do.		do.	do.	do.	
45. Carya porcina	do.		do.	All off on some trees	Nearly all off	All off
46. Carya amara	do.		do.	Falling	do.	do.
47. Quercus alba	do.			Some falling		†
48. Quercus bicolor	Begin to fall		Falling	Nearly all off	A few left	All off
49. Quercus rubra	All on				Falling	†
50. Quercus palustris	do.					Falling †
51. Castanea vesca	Some falling	Falling			Nearly all off	All off
52. Fagus ferruginea	All on	Falling a little	Falling		All off	
53. Carpinus	Some falling	Falling.	Nearly all off	All off		
54. Myrica cerifera			Nearly all on			†
55. Betula lenta	Begin to fall	Falling	Nearly all off	A few left	All off	
56. Betula alba	Many off		do.	All off		
57. Alnus serrulatus	Begin to fall	Falling		Nearly all off		All off
58. Salix alba	In dry situations many off, but not in damp.	Half off even in damp.	Nearly all off	A few left.		Some left.
59. Salix Babylonica	All on	All on	All on	Falling	Nearly all on	†
60. Salix discolor		Falling		A few left		Nearly all off
61. Populus tremuloides			Falling	nearlyalloffsometrees	A few left	All off
62. Populus balsamifera				Some falling	All off	
63. Populus dilatata						Falling †
64. Populus alba	Some falling		Nearly all off	All off		
65. Smilax rotundifolia	Falling	Nearly all off	A few left	do.		

§ 224. **Oaks of the United States.**—In § 105, we gave some account of Dr. Engelmann's observations on this subject, read before the Academy of Science of St. Louis, March 20, 1876. Last October, he read a continuation of that paper, in which he corrects some errors into which he had fallen in the study of this very extensive, perplexing, but most interesting genus. We subjoin his revised arrangement of our Oaks. The names in parenthesis designate subspecies.

I. **Lepidobalanus,** Endl.

A. LEUCOBALANUS.

* Maturatio annua.

† Folia decidua.

Q. alba, lobata (fruticosa), Garryana, stellata, macrocarpa, lyrata, bicolor (Michauxii), Prinus, Muhlenbergii (prinoides), Douglasii, undulata (pungens).

† † Folia persistentia.

Q. oblongifolia, dumosa, reticulata, virens.

* * Maturatio biennis.

Q. chrysolepis (vacciniifolia, Palmeri), tomentella.

B. MELOBALANUS: Ovula abortiva (excepta *Q. Emoryi*) supera, etc., ut in pag. 101.

* Maturatio annua, folia persistentia.

Q. Emoryi, agrifolia, pumila, hypoleuca.

* * Maturatio biennis.

† Folia decidua.

Q. rubra, coccinea (tinctoria), Sonomensis, falcata, Catesbaei, ilicifolia, palustris, Georgiana, aquatica, laurifolia, nigra, cinerea, imbricaria, Phellos.

† † Folia persistentia.

Q. Wislizeni, myrtifolia.

II. **Androgyne,** A. DC.

Q. densiflora.

The collection of oak woods at the Centennial Exhibition furnished interesting facts. The Black-oaks grow, on an average, nearly twice as fast as the White-oaks. The heartwood of the latter is always readily distinguished, but of the Black-oaks is scarcely, if at all, darker than the sapwood. The Black-oaks of the present day are confined to America, principally to the Atlantic region, but in the tertiary period they extended into the old world.

Occasionally Black-oaks are found with cup-scales thickened at base. Prof. Sargent has collected near Cambridge fruits of *ilicifolia* with this peculiarity, and it does not seem to be rare at all in the northern forms of *rubra*. *Q. Emoryi*, in the former part of the paper placed among the White-oaks, has basal ovules, but, being in every other respect a true Black-oak, has been placed in this section.

Q. Muhlenbergii is the name given to what we used to call *Q. castanea*, Muhl., *Q. Prinus acuminata*, Mchx., which the Dr. is satisfied is a very distinct specie, as well as *Q. Prinus*, L. In like manner, Dr. Mellichamp's specimens have enabled Dr. Englemann to re-establish *Q. myrtifolia*, Willd., *Q. Georgiana*, M. A. Curtis, is confined to that isolated granite rock, Stone Mountain, which is also the only locality for *Gymnoloma Porteri*, Gray, and a new Isoetes, *I. melanospora*, described in a note to this paper.

As what are considered hybrid oaks are abundantly fertile, and their acorns seem to be perfectly capable of germinating, the only test is the rarity and individuality of the form, and its character intermediate between two well established species which occur in its neighborhood. Among the White-oaks hybrids seem to be much rarer than among the Black-oaks, or it may be that they are more difficult to discover. Dr. Engelmann knows of only three, all of them pointing to *Q. alba* as one of the parents. Of Black-oaks he names seven hybrids, one of them between *Phellos* and *Coccinea* being *Q. heterophylla*, Mchx. He was formerly inclined to receive this as a species. The typical specimen of Michaux has long since been destroyed, but within the last ten or fifteen years the tree has been re-discovered, and now numbers of individuals are known in low woods on both sides of the Delaware below Philadelphia, often in groups together, probably the offspring of some few original hybrid trees.

§ 225. New Species of North American Uredinei.

BY F. DE THUEMEN.

1. **Puccinia Ellisiana,** Thuem., *nov. spec.* — P. acervulis hypophyllis, gregariis, plus minusve lineariformibus, seriatis, elevatis, atrofuscis, liberis; sporis ellipsoideis vel subclavato-ellipticis, septatis, medio vix constrictis, vertice rotundatis, incrassatis, apice rotundatis, ab pedicello separatis, episporio dissepimentoque crasso, obscuriore, 30–40 mm. long., 18–23 mm. crass., fuscis; pedicello subrecto, aequali, 18–22 mm. longo, pallidissime fusco; paraphysibus nullis. —Certe a *P. Andropogonis*, Fckl., diversa!

New Jersey: Newfield, in *Andropogonis virginiani*, Lin., foliis aridis. Jan., 1877.—Leg. J. B. Ellis.

2. **Puccinia Campulosi,** Thuem., *nov. spec.*—P. acervulis amphigenis, oblongis, liberis, pulvinatis, aterrimis; sporis ovatis, utrinque obtuso-rotundatis, medio vix vel non constrictis, longipedicellatis, fuscis, 36–40 mm. long., 22–24 mm. crass.; pedicello tenui, tortuoso, hyalino, 48 mm. longo; paraphysibus solitariis, hyalinis, sporidio fere aequantibus.—A *P. graminis* Pers. toto coelo diversa!

In *Campulosi monostachyae*, Beauv. (*Ctenii americani*, Spr.) foliis vivis. America septentr; sine loco.—Ex. herb. Dr. C. Keck.

3. **Uromyces Desmodii,** Thuem., *nov. spec.*—U. acervulis amphigenis, in pagina superiore sparsis, minutis, in pagina inferiore dense gregariis, plerumque confluentibus, velutinis, atro-fuscis; sporis ellipsoideis vel globoso-ellipticis, vertice subobtuso, epidermide crasso, dense verruculoso, verruculis minutis, vertice pallidiore, ferrugineis, 24–30 mm. long., 15–18 mm. crass., longepedicellatis,

pedicellis hyalinis, flexuosis, 56–74 mm. long., inaequalibus, superne subincrassatis vel in spora dilatatis; paraphysibus nullis.—A *U. solido*, Berk. et Curt. (Grevillea III. p. 57.) cum soris punctiformibus, solidis, sporis et pedicellis crassis et *U. appendiculoso* Lev., etiam in speciebus *Desmodii* diversum.—Carolina australis; Aiken in *Desmodii ciliaris*, DC., foliis vivis, 1876.—Leg. H. W. Ravenel.

4. **Melampsora Medusae,** Thuem., *nov. spec.* — M. stylosporis acervulis gregariis, amphigenis, minutis, aurantiacis, liberis, pro maxima parte in foliorum pagina superiore; sporis ovoideis, vel globoso-ovoideis, basi angustato-obtusa, apice late obtusata, *episporio laevi*, tenui, protoplasmate granuloso, 20–22 mm. long., 14–16 mm. crass., paraphysibus nullis.—Teleutosporae vix a *M. populina*, Lev. diversae.—Fungus stylosporiferus differt ab *Uredine longicapsula*, DC. (*Melampsora populina*, Lev.) et *Uredine ovata*, Str. (*Melampsora Tremulae*, Tul.) sporis laevibus et paraphysibus deficientibus et propter quem est species propria, diversa!

Carolina australis; Aiken in *Populi angulatae*, Ait. (*P. Medusae* Bnth.) foliis vivis, languidisve (Uredo) vel aridis (Melampsora propria.) 1876.—Leg. H. W. Ravenel.

5. **Coleosporium Solidaginis,** Thuem.—C. acervulis hypo—raro etiam epiphyllis, gregariis, pulveraceis, minutis, tandem confluentibus, inquinantibus, applanatis, fulvis; sporis in catenulis conjunctis, catenulis erectis, sporidiis plus minus ellipticis vel globoso-ellipsoideis, 24–30 mm. long., 20 mm. crass., episporio distincto, crasso, granuloso-verruculoso, 2–3 mm. crasso, hyalino, nucleo flavo, utrinque rotundatis vel ad umbilico applanatis.—*Uredo Solidaginis*, Schwz., Syn. fung. Carol., p. 70, No. 472.—*Caeoma asteratum*, Schwz., Syn. N. Amer. Fungi, p. 292, No. 2,870 pr. p.

New Jersey. Newfield in *Solidaginis puberulae*, Nutt., et New York, Albany, in *S. giganteae*, Lin., foliis vivis.—Leg. J. B. Ellis et Ch. H. Peck.

6. **Uredo Vitis,** Thuem., *nov. spec.* in "Pilze des Weinstockes," p. 182.—U. acervulis hypophyllis, dense gregariis, nonnunquam in maculis fuscis sed plerumque sine maculis, in foliorum pagina superiore maculas parvas, stramineas formans, hemisphaericis, solitariis, nunquam confluentibus, duris, pallide aurantiaco-flavis (tamen in speciminibus exsiccatis), minutis, solidis; sporis guttulaeformibus aut globosis, 15 mm. diam., aut ovatis, 20 mm. long., 14 mm. crass., aut ellipsoideis, 22 mm. long., 12–15 mm. crass., subpedicellatis, basi propagullatis, dilutissime lutescentibus, episporio laevi, crasso, inaequali, plerumque vertice crassissimo.

Carolina Australis: Aiken in foliis vivis vel sublanguidis *Vitis viniferae*, Lin.—Leg. H. W. Ravenel.

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§ 226. **A Nostoc the Matrix of Scytonema.**—Among the fresh water Algæ there is a genus Nostoc, embracing about seventy species described by European and American authors. A Nostoc is a gelatinous sack (thallus), more or less firm, usually sub-globose, filled with watery endochrome in which are embedded moniliform filaments. Nostocs vary in size; some do not exceed the diameter of a human hair, others are of the size and form of peas and cherries; some are indefinitely expanded. They are found on dripping rocks, in pools and springs, on the ground, on trunks of trees, old wood, etc. The Nostoc has generally been considered a perfect plant. Dr. Itzigsohn, Professor J. Sachs and J. Baranetzky, however, have looked upon it as of doubtful character, and thought they traced a relation between one form, Nostoc commune, and the lichen genus Collema. Other authors, however, do not consider their position tenable.

A careful study of a number of forms has led me to the conviction that Nostocs are not perfected plants, and, reasoning from analogy, I would call them the matrices of Scytonema. I believe the many forms of the large genus Scytonema are all evolved from them.

For illustration of the general principle I take several forms. The one that first elicited my attention was collected in Florida, by H. W. Ravenel, from the bark of a Cypress tree. The plant evolved from it, Scytonema mirabile, n. sp. is very distinct in the so called twinned pseudo-branches, and, hence, particularly suited for tracing the various stages of development.

Having reference to the plate, figs. A, A, represent two small matrices (nostocs) in their normal character. B, another form, in which the filaments, which possess an Oscillaria-like power of movement, have arranged themselves in sub-parallel order. C, an older form, partially faded, and apparently diffluent. Many do really die and pass off in this manner, but here and there one comes to maturity and evidences by faint outlines the developing forms of the true plant. These are vermiform figures nestled together in the matrix, (C). When at full maturity for delivery, the matrix breaks and the young plants escape; these are usually more or less fusi-form (E, E,) thin, membranous, with but a slight indication of an internal filament. These forms are often so distinct from the matured plant, that they could not be identified except by tracing them from their origin to their full development. In the process of growth the young plants present many forms; F, the first stage of a twinned branch. G, H, J, J, are apparently more advanced growths. These may be faded forms of young plants, nevertheless they represent different stages of development. Fig. R is a perfected plant. The specific features are the frequent twinned pseudo-branches adhering, and usually without separation of the trichoma, at the end.

For my second illustration I take forms collected repeatedly during the past summer in this vicinity from dripping rocks; they are Nostoc sphaeroides, Ktz. and Nostoc riparium, Cessati. Among the larger forms in older condition, some are found in which the young, immatured filaments may be distinctly seen.

1- p.220.

Kützing, Agardh, Cessati and others describe Nostocs which have the filaments sometimes sheathed, not always, and usually indistinctly, "indistinctis vel diffluentibus." The descriptions given accord well with the appearances of these forms, (M). The process of development in some is not unlike the one before described. In others it is quite distinct. I had several matrices, which after having been kept in water eight or ten days, literally fell to pieces under slight pressure, and spread out a whole nest of young Scytonema filaments (W, W) linear, short, somewhat curved and membranous forms. These elongate into filaments, (V, V).

In other Matrices (N) the sheathed filaments break up into smaller parts, each of which forms a separate cell or sack, in which the cellules of the parts of the moniliform filaments divide and multiply. After a time the distended epidermis of the matrix breaks, and the young are scattered. These are usually subspherical (P) or oblong (Q) and often in series, two to six united, (P, Q). Each contains a single filament, more or less coiled A heterocyst generally makes a link of union. In the process of development the filament uncoils and lengthens, the epidermis at first subspherical (P) elongates also (Q) and finally when the filament is straightened out (S, T) the epidermis is brought close to it, and thus constitutes the sheath of the trichoma, (T).

The young plants vary in size, and undeveloped they may easily be mistaken for distinct species. X, X are fully matured plants. Very young forms (Q, T) are occasionally observed to put forth the characteristic double pseudo-branches.

Nostocs of other forms, and particularly those of irregularly expanded thalli, develop the plants by a more simple process. The cellules of the moniliform filaments expand and unite; the walls of union are absorbed and thus a continuous filament is formed, which develops the true plant. Specimens of this kind occur among gatherings made at Niagara, and in this vicinity, but the most perfect were found among the extensive collections made by C. F. Austin and J. Donnell Smith during the past month of March in South Western Florida. In a small portion of the gelatinous mass of a matrix, no larger than to be visible under one-fifth objective, the various stages of development may be seen intermingled.

There is a form of a plant which I often found difficult to separate from the true Scytonema because it is so much like it, but sometimes in part, assumes the Tolypothrix character. The life history is distinct and separates it readily.

Matrices appear to be of three kinds. The majority are sterile, others develop Scytonema, and a third class, apparently reproduces its like in the manner hitherto described by many authors.

Many details and peculiarities might be added, but the object of this article is not to present a full history, but simply to record facts for the benefit of those interested in this subject, and to aid in farther examinations. One thing more may be noticed, the circumstance that led to these investigations, that is, that Nostocs and Scytonema are usually found together, more or less intermingled, sometimes the one and sometimes the other predominating. FRANCIS WOLLE.

§ 227. **Localities.**—I give below a list of desirable plants which I have collected in the localities named. Most of the stations are readily accessible from the city, and the plants, for the most part, occur in sufficient numbers to bear considerable collecting. All the places named are in N. J., unless otherwise stated. The Roseland referred to was formerly Centreville, in the northern part of Livingston.

Ranunculus Cymbalaria, Pursh. Rockaway, L. I. ; quite abundant.

Viola cucullata, Ait. Var. *cordata ;* Franklin, rare ; var. with white markings ; more com. than the above.

V. pedata, L., Var. bicolor ; Rockaway Station, L. I. ; abundant near school-house.

V. pubescens, Ait., Var. *scabriuscula*, Torr. & Gray ; found this season at Franklin, in Camp-meeting Wood.

Arenaria squarrosa, Michx. ; very abundant just east of the bridge crossing Bass River, on road from Atsion to Tuckerton.

Stellaria longifolia, Muhl. ; com. in low grounds at Franklin.

Cerastium nutans, Raf. ; Bloomfield, not common.

Geranium Carolinianum, L. ; com. at Franklin, in cult. ground.

Erodium cicutarium, L. Her. ; occasionally found near the woollen mills at Franklin, where it is introduced in wool.

Staphylea trifolia, L. ; abundant on a bank just west of Paterson.

Polygala ambigua, Nutt. ; quite frequent at Franklin, with P. verticillata.

P. paucifolia, Wild ; south of the swamp at the head of the upper mill pond, Franklin.

Trifolium procumbens, L. ; a troublesome weed in some gardens and cultivated fields at Franklin, where it has been introduced in wool.

Robinia hispida, L. ; Franklin, very sparingly in the edge of a water-cress patch.

Vicia cracca, L. ; found once near Bellevue Nursery, Paterson.

Lathyrus palustris, L. ; I have this specimen in my herbarium, but the note of locality is lost. I think I found it near Kingsland Station, D. L. & W. R. R., where var. *myrtifolius* grows quite abundantly.

Poterium Canadense ; abundant near county line, on road from Franklin to Passaic.

Potentilla tridentata, Ait., [!] grows sparingly in fields at Irvington, N. Y.

Proserpinaca pectinacea, Lam. ; banks of Passaic, near Erie R. R. Station, Newark.

Oenothera pumila, L. ; Franklin, not common.

Cuphea viscosissima, Jacq. ; quite frequent and abundant at Franklin, in grainfields, and meadows.

Sicyos angulatus, L. ; not rare in Bellville, near the Passaic.

Discopleura capillacea, DC. ; salt marshes between Kingsland Station, and Hackensack River.

Cicuta bulbifera, L. ; not infrequent at Franklin, on Second River, and its chain of ponds.

Houstonia caerulea, L.; Franklin, on high land, a mile or more from the Passaic. [Quite common in the country about the Passaic. Eds.]

Eupatorium rotundifolium, L.; Montclair and Franklin; not com.

Diplopappus cornifolius, Darl.; Franklin, Camp-meeting Wood.

Centaurea nigra, L.; collected once in Bloomfield.

Lysimachia lanceolata, Walt., var. *hybrida;* upper mill-pond, Franklin; var. *angustifolia;* with the above.

Aphyllon uniflorum, Torr. & Gray; very com. in and about Franklin.

Mimulus alatus, Ait.; Bloomfield; situations very wet; rare.

Castillaea coccinea, Spreng.; Roseland; not common.

Pedicularis lanceolata, Michx.; abundant near county line, on road from Passaic to Franklin.

Cunila Mariana, L.; com. in the neighborhood of Brookdale, and Little Falls.

Monarda fistulosa, L.; roadside near Kingsland's paper mills, Franklin.

Echium vulgare, L.; roadside near Duncan's mills, Franklin; introduced in wool.

Cynoglossum Morrisoni, DC.; Franklin; not common.

Datura Tatula, L.; Passaic River, at Newark; also at Sandy Hook and Long Branch.

Gentiana crinita, Froel.; rather abundant in some localities at Roseland.

Obolaria Virginica, L.; about one hundred yards south of a line running west from Upper Montclair Station, M. & S. L. R. R., growing there in profusion.

Celtis occidentalis, L.; sparingly among the hills near Paterson.

Peltandra Virginica, Raf.; abundant on borders of Kingsland's Creek, near Kingsland Station, D. L. & W. R. R.

Orontium aquaticum, L.; grows sparingly and not very luxuriantly at Roseland.

Alisma Plantago, L., var. *Americanum;* Gray; this I find occasionally at Franklin.

Liparis; I have found both species together with *Obolaria.*

Cypripedium parviflorum, Salisb.; High Mountain, north-west of Paterson.

C. pubescens; quite com. on mts. of Montclair.

Trillium cernuum, L.; borders of swamp at head of upper mill-pond, Franklin; not very abundant.

Chamaelirium luteum, Gray; very abundant just south-west of the above swamp. It is worth a long journey to behold this flower-garden in full bloom, about the first of August.

Ornithogalum umbellatum, L.; com. in Franklin; farm of Mrs. Elizabeth Stager.

Commelyna Virginica, L.; Camden, near West Jersey R. R. Station.

Selaginella rupestris, Spreng.; rocks near Passaic Falls, Paterson.

I have this season found a very curious freak in a flower of *Ranunculus repens.* The sepals are entirely wanting, and many of

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A NOSTOC THE MATRIX OF SCYTONEMA. (p. 217.)

the stamens are reflexed, so that they protrude between the petals, backward almost to the flower-stalk.

I consider it remarkable that my brother, while collecting for me two years since, found *Rubus odoratus*, L., well established in swamps, in Dade Co., S. Fla ! The specimens sent me seemed to be rather depauperate, and the clammy hairs disposed to be stiff.

At the same place he found magnificent specimens of *Cephalanthus occidentalis*, with leaves over six inches long, without the petioles, glabrous and shining, margins reticulate.

H. H. Rusby.

We may add to this list *Oldenlandia glomerata*. Mchx. Mr. A. Brown found a patch at Rockaway last September.

§ 228. **Lygodium palmatum in Tennessee.**—Prof. Eaton in Ferns of America, No. 1, says this species "occurs, how profusely is not known, in Virginia, Kentucky, Tennessee, the Carolinas, Georgia, and probably in Alabama."

The question of its profusion in one locality in Tennessee is settled by the discovery, by Prof. A. G. Weatherby of the Cincinnati University, of large patches of this beautiful species on the line of the Cincinnati Southern Rail Road, a few miles north of Chitwood, Scott county. Prof. W. says that there are "literally acres of it;" and the specimens brought from the locality are large and fine.

Davis L. James.

§ 229. **Publications.**—1. *Smithsonian Miscellaneous Collections*, 258. *Biographical Index to North American Botany, or Citations of Authorities for all the recorded indigenous and naturalized species of the Flora of North America, with a chronological arrangement of the synonomy*, by Sereno Watson, Part I. POLYPETALAE. Washington, March, 1878. Probably no single work of so great interest to American botanists has appeared since the publication of Torrey & Gray's Flora. It is a work of vast labor and critical research which could only have been accomplished with the aid of the rich resources of Cambridge, and that it is carefully done both the name of the author assures us, and we find from consulting the pages for the species which we have more particularly studied, The Genera Plantarum of Bentham & Hooker has been followed in the sequence of the orders, excepting Paronychieae, while the genera and species are arranged alphabetically for greater facility of reference. The present part includes 69 orders, the last being Cornaceae ; 545 genera ; and 3038 species. This gives a little less than 8 genera for an order, and a little more than 5½ species for a genus. From Bentham & Hooker for the same orders, we estimate about 35½ genera to the order, and about 12 species to the genus for the whole world as far as known. On this estimate the North American flora represents about 10 per cent. of the species, and 22½ per cent. of the genera of these orders ; or, in other words, is more than twice as rich in genera as in species.

A work of this nature must always remain incomplete, owing to the multiplicity of publications, the difficulties of synonomy, and the necessary delays in publication. To the 442 pages in the body of the work are added 25 of additions and corrections, of which it is a noticeable trait that a very considerable proportion of the omissions refer to the publications of Mr. Watson himself. It is intended to give with the final volume a full bibliography, not only of the works and articles here cited, but of all others relating to the North American Flora. The Smithsonian has put the price, in paper covers, at $2.00, a few copies, bound in cloth, may be obtained at Cambridge for 25 cts. extra.

2. *Synoptical Flora of North America*, by Asa Gray. The May No. of Silliman, just received, announces the First part of Vol. II. of this work, beginning with Vol. II., because it takes up the American Flora, where "Torrey & Gray" dropped it five and thirty years ago, viz.: at the end of the Compositae. The present publication includes all the Gamopetalae after Compositae, 402 pp, 8vo., indexed and bound in cloth. The Curator of the Harvard University Herbarium will send it by mail at the cost price, $5, or it may be obtained of the publishers, Ivison, Blakeman, Taylor and Co., New York. With this work, and Mr. Watson's Index, American botanists will no doubt find fresh reason for celebrating the birthday of Masachusetts.

3. *Ferns of North America.* Parts IV and V. This beautiful and valuable work keeps well the promise of the earlier numbers. The present instalment contains a fine plate of Cheilanthes viscida, Davenport, lately described in the BULLETIN.—4. We have received two short articles contributed by M. Alph. De Candolle to the Archives des Sciences of Geneva, Jan. and Feb., 1878. The one is a notice of the report of a visit made in 1876 by the members of the Botanical Society of France to the garden of M. Jordan, near Lyons. This remarkable collection has assembled in a limited space sixty thousands of plants, representing almost all the genera of Phanerogams of France, in numerous examples, and coming from the most diverse localities, from the sea coast to the highest summits of the Vosges, the Alps, the Jura and the Pyrenees, all in order, ticketed, numbered and so arranged as to show at sight the differences between allied species: the great majority of them having been under cultivation for many years. The second article, *sur l'existence de races physiologiques dans les espèces végétales a l'état spontané*, gives the results of very careful experiments made by the writer, and, quite independently by MM. Naudin & Radlkofer, on the comparative vigor of plants from seed obtained from European localities differing greatly in latitude and climate. The difficulties in obtaining satisfactory results proved greater than would be expected, and the results in the few cases that succeeded are not very determinate, further than to show that such plants do differ. M. DeCandolles conclusion is interesting, as showing what so able and so scrupulous a naturalist thinks of evolution. "La succession des formes demontrée, le mode d'évolution et ses causes sont encore dans le domain des probabilités et des hypothèses. Aussi quand je veux me representer tel ou tel naturaliste moderne traduit devant une reunion de mathématiciens, de physiciens, de chimistes, etc., pour donner des preuves positives et directes de la transformation d'espèces végétales ou animales, assurément j'estime qu'il serait embarrassé. D'autres naturalistes, fidèles à d'anciennes idées, lui feraient une foule d'objections de détail, et le malheureux se verrait peut-être obligé d'avouer qu'il a des

indices, mais pas de preuves absolument directes. Apres cet aveu il pourrait cependant réfléchir à la succession incontestable des flores et des faunes dans toutes les parties de la terre, et alors il lui serait bien permis de dire à ses juges, en parlant de l'espèce : ' E pur si mouve.' "

§ 230. **Southern Plants.**—Mr. A. H. Curtiss, of Jacksonville, Florida, has issued his first fascicle of dried specimens of Plants of the Southern United States, well named, with full printed tickets, at the price of $20 for 250 species. We have Dr. Asa Gray's authority for saying that the specimens are so well chosen, so full and in every way excellent, that they are very cheap for the money.

§ 231. Some Rambling Notes on Collecting and Preserving Herbarium Specimens,

I. At present, judging from the letters I have received on the subject, there seems to be a disposition to make better specimens for the herbarium than has heretofore been deemed necessary. This desire for better workmanship is good and should be encouraged.

A plant designed as a herbarium specimen has the possibility of a moderate immortality opened before it, for it may be destined to be preserved for centuries, and often be consulted for reference when its preserver has long since passed away and perchance returned as food for the plants among which he so long delighted to linger and study.

During the past few years I have answered many inquiries in regard to my manner of preserving plants, and as the queries still keep coming and there appears to be a felt want of fuller details on herborizing, I purpose, in two or three numbers of the BULLETIN, to offer a few suggestions on collecting and preserving botanical specimens.

Let it be understood at the outset, that these prospective notes are mainly designed for those who wish to know how to make good specimens, and also for the younger class of botanists who have very little knowledge yet of the details of collecting and preserving. The old and experienced collector will probably find little that is new to him in these suggestions, as we suppose that the better class of specimens are prepared more or less in the same way. Comment on the notes will be welcome, and if, in any of my suggestions I go astray, I shall be glad to be set right, or if any one has a better method of preparing plants let it be given for the benefit of the novice and, in truth, of us all, as we are all groping after something better and higher from the beginning to the end of life.

Again, it is not to be supposed these notes will have any beneficial effect upon that class of collectors who claim (and they practise zealously what they advocate) that a specimen is made more *natural* (?) by being hastily thrown into press in a hap-hazard kind of way, wilted and crumpled, and then left to take care of itself,—probably not looked at again, until taken out only partially dry but already black and mouldy, to make room for other specimens that are to be brought likewise into the same execrable condition. So long as our admirers of " nature " can secure in an exchange good specimens for their *natural* ones, we apprehend they will go on complacently making their herbarium *fodder* and paying very little regard to what may be written on the subject for their improvement. But one other point of our friends and then I shall proceed to the consideration of the main object of these papers. It is to be admitted, for boiling and dissecting, their *dishevelled* specimens,—but not mouldy ones,—may answer very fairly every purpose, but this argument fails when applied to the herbarium, for it is only in extreme cases we wish to have our specimens *boiled down* and picked to pieces. Figuratively, the herbarium is a book of reference, and as a book of reference let its workmanship be such that we can take in it an unaffected pride and a hearty pleasure, while its scientific value will not be impaired but enhanced by these qualities. LYMAN. H. HOYSRADT.

NOTE.—Mr. Hoysradt requests us to say that his Catalogue of Pine Plains Plants will be completed in the July or August BULLETIN.

§ 232. **Growth of Exogens.**—The recent observations on this subject by Mr. Willis and Mr. Waring remind us, that Lindley, in the *Penny Cyclopædia*, and in the *Vegetable Kingdom*, under the head of Exogens, has treated of some remarkable anomalies of growth, and refers to similar observations made by Jussieu, Schultz, Decaisne, Gaudichaud, Schleiden and others. We hope that some new light will be thrown on the subject from the present fresh start. Calycanthus, (Lind. Veg. King. sub. voce,) presents a fine subject for study.

Mr. Willis reminds us that in the Spring of 1877 he presented to the club a number of the cross sections of exogenous stems and took occasion to draw attention to abnormal formations of rings of growth, in some of them, one in Robinia Pseudacacia, which seemed to be pinched off on one side or to fade quite away, while some in a cross section of Rhizophora Mangel appeared not only to present complete faults, to use a geological expression, but to possess no corresponding part on the other side of the centre of growth. In a specimen of Abies Canadensis, appeared a wide semi-ring the ends of which were pinched off on opposite sides of the half section, the termini presenting a cuneate form. He had also noticed the same thing in an oak.

§ 233. **Viola sagittata, Ait., Variation.**—Leaves shorter than in V. sag , varying from ovate-oblong to nearly orbicular, thick, crenate, and, with the broad, fleshy petioles, softly hairy on both sides, but the under side shiny; spur shorter and broader than in V. sag., stigma not so strongly beaked ; flowers small, purple-blue, varying to white, with purple spur, and lower petals purple-streaked, as in V. lanceolata, L.

This form is so strikingly different from V. sagittata, Ait., that I, at first, believed it to be a distinct species, but Dr. Gray says it is a form of sagittata, and suggests the possibility of insect agency having produced the white forms. Specimens since found, however, seem to indicate a gradual variation from blue to white. H. H. RUSBY.

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Vol. VI., No. 41.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, May, 1878.

§ 234. Some Rambling Notes on Collecting and Preserving Herbarium Specimens.

II. **The Collector's Outfit.**—Before entering on a botanical ramble let us see what we shall need take with us on the trip. On an ordinary excursion it is well to be provided with both *portfolio* and *botanical box*. The former is preferable in most cases, for with plenty of specimens in it, its capacity is quite unlimited, and besides, there are many occasions in which plants of a delicate texture, or having ephemeral floral parts, as many of the aquatics, the Helianthemums, the Tradescantias, and others, would be greatly impaired by carrying home first before putting in press. Plants of this class should be put into portfolio or press immediately after being gathered. On the other hand, a box is very essential to carry plants which we wish to examine fresh, and also plants having thick roots, large fruits, etc. When the collector's time is limited, and we wish to explore as large a territory as possible in the period at our disposal, for instance, while a train or boat is delayed, or having only a leisure hour's run in the fields and woods, then necessarily the box becomes the favorite. Also on a windy day it is perhaps preferable; for there is little that is more vexatious or calculated to call out the "Old Adam" of our nature than endeavoring to put specimens into the portfolio when a lively breeze is playing among our papers and specimens, and no place handy to seek shelter from its airy and sportive caresses.

For home excursions, if the portfolio be well stocked with paper, the box need be quite small. The one I have used with much satisfaction is of oval-cylindrical-shape, 17 inches long, 4 by 6 inches wide. It is light and convenient to carry, provided with a light strap to throw over the shoulder, and so attached to box *near* front narrow side as to have the lid open from the person when hung on the shoulder. The lid opens nearly the whole length of one of the flat sides,—15 by 4½ inches, with ¼ inch lap,—made to fit as tight as possible, and fastens with a simple spring catch, effective and convenient, a great improvement over the old way of fastening, which has to be held in place with peg or key. I have seen and used a number of different boxes, but I give my preference decidedly to the one described above.

For extended trips of several days, I formerly used a much larger box with a lunch compartment at one end, something like the pattern referred to by Dr. Bumstead, in Vol. II., p. 33, of Bulletin. It is 21 by 9 x 6 inches. But it is much too heavy to carry with the portfolio, and in fact too heavy, even when used alone, for mountain rambling. For long trips when the collector wishes to bring home a large number of fresh plants, I should prefer, instead of such a large cylindrical box, one made something like an old-fashioned trunk with a wooden handle in lid to carry by. It should be large, say 21 inches long, 12 inches wide and 12 inches high to top of lid, which opens like that of a trunk and is very convex. It is to be left in some central place, or where we make our headquarters for the night, and made a kind of depository, while the small box is used for collecting. Of course this plan is feasible only where we expect to radiate around one or more central points during the trip, yet I have made many extended excursions and always found it practicable. The chest is portable and not so heavy as a large box of usual pattern, and in travelling, if desirable, the small box can generally be carried inside the chest. Such a tin chest keeps plants fresh and handsome a long time, and permits a better arrangement and easier handling of contents.

The portfolio, 18 by 12 inches, usual size, is subject to some variation in its arrangement. Some collectors prefer simply two pieces of *binder's boards* covered with enamel cloth and merely fastened together with a strong cord or strap. This filled with *specimen* paper is ready for the excursion. Simple and well-adapted to field-work, is the verdict in its favor. After several years use I have found one made something after the following pattern at all times give excellent satisfaction, and it has some advantages not found in the other, though costing a trifle more. It is made of two rather thick pieces of binders board, covered like the first, each having a handle like a carpet bag for carrying. One of the sides has a stiffish bottom interior apron to keep the papers from slipping, and both of the sides are fastened together at bottom with two or three small buckle straps that can be let out when the portfolio is filling up. Similar straps are in front and one on each side, but these are seldom used, and instead there are a couple of straps attached which go around the whole portfolio, so that small or heavy pressure can be given as desired. By using more driers and changing, I can preserve plants very finely in the portfolio when travelling,—but this is a secondary consideration, the main use of the portfolio being to collect for home press, and for this purpose not much pressure is required, merely sufficient being demanded to hold the specimens snug and not allow undue shrivelling.

The portfolio should be stocked with a sufficient quantity of thin unsized paper,—folded sheets; tea-paper will answer, but it is not very good economy to use sheets so much smaller than portfolio, for of small plants a sheet will not hold so many specimens, and besides such small sheets finally bring the plants too much into the middle of the pile when pressing, making it too rounding to press evenly and well. It is better to have *specimen* (I will call them by that name) sheets of nearly the size of the portfolio, and driers 18 by 12 inches. I prefer a poorish quality of printing paper. The folded sheets are 11 by 17 inches, and this allows for shoving a little, and keeps the edges from getting curled and torn. 11 by 16 is a good size. It costs $2.25 to $2.50 a ream, according to quality, at paper ware-house, and usually comes double the size required, but it is easily cut and folded, each ream giving 960 folded sheets. This is as cheap, notwithstanding the difference in size, as tea-paper which costs about 75 cents a ream—a ream of this having only 320 sheets. I have used also rather largely for specimen sheets thin manilla paper. It is excellent for coarse, rough plants, as it is stronger than white paper, lasts longer, and gives very nearly as good results.

I insist strongly upon the importance of using specimen paper in pressing. Do not attempt to get along without it. Many plants, as

Caulophyllum, the Dentarias, many of the Cruciferæ and Leguminosæ, and others outside of these orders, are so delicate and sensitive that they will not bear the least handling, unless enclosed in sheets, without curling and shrivelling, an attempt to transfer them from one drier to another, unless enclosed, only resolves them into tangled confusion. The specimens should be left in these papers through all changes of driers, until thoroughly cured, and it is a good plan to let them remain in these sheets even afterwards, until wanted for mounting or for exchanging. The specimens, by so remaining, are kept in much finer condition than by taking them out and huddling together in other papers. Besides it saves time of transferring, an important item during a busy collecting season.

In getting ready for a tramp it is a good idea to put several driers into the portfolio with specimen paper. It is not necessary to have a drier between every paper as some young collectors think,—in fact, for a trip of a day, or two or three days even, the plants keep fresher and nicer by having sheets with specimens next each other than with driers interposed. Only a few driers are desirable, interposed to keep thick and stubborn plants from making the pile too uneven when putting into portfolio.

Driers will receive notice later on under another heading.

For digging up roots, bulbs, etc., I have used nothing better than a small *triangular trowel.* 'Its blade is about 5 or 6 inches long, sharp pointed, and known, I believe, as the masons' smaller pointing trowel. It can be obtained at any hardware store, and costs about 30 cents. Be careful to select one strong and stiff. Perhaps one fully as good, if not better, is the Webb botanical trowel, represented on page 34, Vol. II., of Bulletin. It is made from a large triangular file, to which a curvature of nearly an inch of point part can be given by a blacksmith. The teeth should be ground off, and a handle fitted. A leather case to carry either of the foregoing trowels would be found convenient and probably save from annoying losses.

Always carry a *knife*, Part of one edge of the first trowel can be ground sharp for cutting, but it is much better to have a strong pocket-knife with you.

It is well to be provided with a good *lens* on an excursion. It will be found very useful if not necessary in collecting specimens of many of the more difficult and recondite families, where the distinctive characteristics of the species are minute and often obscure, as in the sedges, grasses, mosses, etc. The Excelsior, Gray's, or Coddington Lens all answer a very good purpose for field work.

Last, but not least, be sure to take a *note book* with you on the excursion. This I regard as one of the most important requisites of the trip. Habitats of rare plants, with many valuable observations may be noted down in the field, which may be afterwards of deep personal, and, possibly, public interest, and which would be often entirely lost if left to unreliable memory.

Whether it be a good plan on an ordinary occasion, to cumber himself with a descriptive botanical work, I leave to the collector to determine. Some botanists always carry one. In new or remote regions there are times when it might prove serviceable. But on an ordinary trip it hardly pays. It adds too much unnecessary weight, while a good botanist will probably recognize all the plants he encounters even if there be some new to him.

When it is desirable to take a luncheon along and not convenient to carrry it in the small box, it is better to provide a small *haversack* made of light enamelled cloth and carried on the back. It weighs only 2 or 3 ounces, comes handy for various purposes, and is preferable to adding an extra compartment to box, as this addition, I have found, adds more in weight than utility.

A good, stout, easy-fitting pair of *boots* or *shoes*, should be worn on a long tramp. They should have thick, broad soles, broader than the foot, and low, wide heels, for easy walking. English walking shoes are excellent for fields and mountain climbing, but as many of our rarest plants are to be found in swamps, marshes and low, wet grounds, boots, perhaps, on the whole, are preferable to shoes for botanizing,—unless one is willing to follow the example of an enthusiastic botanical friend, who, in traversing some deep, miry swamps, in company with the writer, would deliberately pull off his shoes as he came to each swamp, and explore the batrachian wilderness barefooted.

Rubber boots, except for a limited period in marshes or swamps, should not be worn. They soon become unendurable to wearer, and early put him *hors de combat.*

Light, loose-fitting clothes will be found most comfortable. For a trip of several days or longer, flannel shirts are to be recommended, —blue or gray is preferable. For alpine botanizing, where the air is often exceedingly chilly, a warmer dress is necessary.

Finally, ere concluding these notes on the *outfit*, let the young collector be cautioned against carrying too heavy a burden on setting out on an expedition. It is a temptation into which young botanists are inclined to fall. In the morning in his freshness and vigor, the load will probably not seem over heavy, but after some hours tramping through tangled swamps, sinking morasses, and over dipping bogs, its oppressive weight will be painfully recognized.

Rather than carry a very heavy box all day, it is better to bring in the surplus specimens wrapped in Osmundas, and the bundle tied with grasses. I have frequently done this,—the bundle being slightly moistened, the most delicate plants can be kept as fresh as in box.

§ 235. **Publications.**—1. *Synoptical Flora of North America.* When thirty-five years ago Torrey & Gray's Flora of North America had been brought down to the end of Compositae, the rapid extension of our territories and exploring surveys, brought such an acccumulation of new material, that these eminent botanists suspended their work on the Flora, and, with others, devoted themselves to working up the new species and correcting the old determinations with the light afforded by the more abundant and complete specimens. This work has at length been accomplished. New species and new genera will no doubt continue to be added, but the great features of our Flora are determined. In the interim Dr. Torrey has departed, leaving a name that will ever be revered as that of one who first laid broad and deep the foundations of American botany. But Dr. Gray, his pupil, survives, with matured wisdom and erudition, and it is a subject of great congratulation that we find him, still in the vigor of his powers, resuming the task apparently so long suspended. As the harvest is about ripe, we may hope that the gathering will take a comparatively short time. The whole work it is calculated will be contained in two volumes of about 1200 pages each. The first volume will "cover the ground which was gone over in the work referred to (now wholly out of print as well as antiquated)." The present issue, Part I. of Vol. II., begins where that stopped and comprises the remainder of the Gamopetalæ. Part II. of Vol. II. will be devoted to the Apetalæ and Gymnospermae, "and the final portion to the Monocotyledones and the Vascular Cryptogamia. "Compactness being essential, only the leading synomy and most important references are given, and these briefly." The descriptions are in English, and the arrangement and typography admirable for the purpose of investigation. The fuller synonomy and bibliography will be found in Mr. Watson's Index, which is expected to proceed pari passu with this Flora. The territory covered is the United States and all the North American continent and islands northward, Greenland excluded. The order followed is that of Bentham and Hooker, whose Genera, as far as published, end with Plantaginaceae, as does the work before us. Dr. Gray, however, separates Lobeliaceae from Campanulaceae, and, on the other hand, comprises the Vaccineae and Monotropeae under Ericaceae, immediately after which he places Lennoaceae, (Torrey's Ammobroma and its allies,) and not with B. & H. after Diapensiaceae. Dr. Engelmann supplies the genus Cuscuta. We find Solanum Fendleri, of New Mexico and south, now recognized as Solanum tuberosum, L., *var.* boreale, so that we can now say that the potato is a native of the United States. There are described in this Part of the Flora 1663 species, belonging to 321 genera and 32 orders. The corresponding orders in Bentham & Hooker have about 1340 genera and 18,800 species. This gives, for the World, an average of about 42 genera for one of these orders, and 14 species for a genus; for North America about 10⅓ genera for an order, and 5⅕ species for a genus. Thus we have about 24 per cent. of all the genera and 9 per cent of the species, showing a still greater preponderance of genera over species than in the case of the Polypetalae which we pointed out in the notice of Mr. Watson's Index. Dr. C. W. Short, of Columbia College, in speaking of Dr. Torrey's genial influence, once remarked that his greatest contribution to science was his pupil, Dr. Gray. New York botanists may well take pride in claiming these eminent men as compatriots. The publisher's price for this part is $6. Ivison, Blakeman, Taylor & Co., New York. It may also be obtained from the Curator of Harvard University Herbarium, Cambridge.

2. Papers from the Transactions of the Academy of Science, St. Louis, Vol. III., No. 4, by Dr. George Engelmann: *The Flowering of Agave Shawii.* The phenomena presented by a fine specimen in Mr. Shaw's greenhouse are here described and illustrated by this

accurate observer. The flower stalk began to rise early in July. After September 5th, (when it had reached a height of about 47 inches) the growth diminished rapidly; about the end of the month the head began to swell, three months later the first blossoms opened, and the flowering season occupied from six to seven weeks. The first flowers opened on the lowest branch, the innermost ones of each cluster first. On the second day the anthers are shrivelled though quantities of pollen remain adhering to them even to the fifth day [in the green house] when the style has reached its full development, more than an inch higher than the stamens. The stigmatic fluid remains fresh the second and even the third day. While the flowers were open the whole tube was filled to the brim with a sweetish watery liquid. Mr. Greene found a similar phenomenon in Agave Parryi, in New Mexico. Dr. Englemann invites attention to this secretion in other cases, as A. Virginica exudes only a small quantity of honey in the base of the tube.—*The American Junipers of the Section Sabina.*—*A Synopsis of the American Firs*, *(Abies*, *Link,)* *i. e.*, Balsams not Spruces. Dr. Engelmann remarks: "It is a most interesting as well as significant fact that while the anatomical structure of the leaves of higher organized plants shows considerable uniformity, so that it rarely can be made available for diagnostic purposes, the conifers exhibit such a wonderful variety of leaf structure (approaching thereby the lowest orders of vascular plants), that often a single leaf is sufficient to recognize the genus, and often the species, even when the ordinary characters may leave us in doubt." In the case of the Junipers "the edges of the leaf are rarely entire, mostly delicately denticulate, or irregularly fringed with minute corneous often curved processes." The figures given represent the margin of the leaf when magnified 280 times, but a much lower power will enable the student to recognize its character. Of our species, J. Californica, Carrière (J. tetragona, *var.* osteosperma, Torr.), has the fringe most marked, J. Virginiana, L., the least or almost straight. Of the nine species of Sabinae enumerated, three, J. Mexicana, flaccida, tetragona, are confined to the highlands of Mexico; J. Bermudiana to the West Indies. J. Californica is peculiar to the coast ranges and islands of California; J. pachyphloea, Torr., (with thick bark) to the interior of Arizona and New Mexico. J. occidentalis, Hook., is characteristic of the whole western mountain region from West Texas to California and Oregon, some, having a diameter near their base of three feet, must be upwards of a thousand years old. J. Sabina, L., *var.* procumbens, Pursh, does not come south of Maine and shores of the great Lakes. J. Virginiana, L., is singular in its wide distribution; it is not found, however, in California and perhaps Oregon. J. communis, L., whose leaves are wholly acicular, does not belong to this section. As the propriety of calling the flowers of Juniperus, at least the staminate heads, lateral has been questioned in the Club, we were curious to see what Dr. Engelmann has to say on the subject. He is rather obscure: "The male FLOWERS (*vulgo* aments) and female aments have, like the peduncles, and in continuation of them, binate or ternate scales; the edge of the anther-scales corresponds in its character to the margin of the leaves of the same species." With regard to the Firs, the anatomical points of most importance are; the resin ducts of which there are always two in the Abies leaf, readily seen in a horizontal section; the presence or absence of stomata on the upper surface; and the presence, distribution and relative size of the hypoderm cells—robust longitudinal cells, with thick walls and a very slender cavity, almost always present on the edges and keel of the leaf and often forming a stratum on the upper side. These cells seem to form the most certain distinction between A. Fraseri, Pursh, of the high mountains of North Carolina, our A. balsamea, Marshal, and A. subalpina, Engelmann; the first having an almost uninterrupted stratum of hypodermic cells on the upper side of the leaf; the second scarcely any; and the third, which is the western representative of *balsamea*, more abundant cells above than under it, and crowded on edges and keel. The next four species have the resin ducts close to the epidermis of the lower side, towards the edges. A. grandis, Douglas, and A. concolor, Engelmann have the hypoderm cells in interrupted strata under the upper surface of the leaf; A. religiosa, H. B. K., and A. bracteata, Don, in a continuous layer. A. grandis has no stomata above, A. concolor has. A. bracteata has glabrous scales, and may thus be distinguished from the Mexican A. religosa and all other firs. The 8th and 9th species have the resin ducts, like the last four, close to the epidermis of the lower side, and in fertile branches equidistant from the edges and keel, but it is questioned whether 8, A. nobilis, Douglas, and 9. A. magnifca, Murray, are really distinct; Dr. Engelmann, inclines to think they are; Drs. Hooker and Gray, that they are not. In giving this diagnosis we have omitted all the other distinctions of more service in determining the trees when met with, as we wished to give an idea of these crucial anatomical points in the case of doubtful specimens, and we have not perhaps done justice even to these. After all it is very difficult to tie nature down to logical exactness. We see in Nature, Ap. 18th, that Mr. J. Gorham, in a paper read before the Linnean Society undertakes to detect the genus of an umbelliferous plant from an examination of the venation of the merest fragment. We wish we had room to extract some more graphic parts of the description of these noble trees.

§ 236. **Opuntia Ficus-Indica, DC**.—I have received from Dr C. H. F. Peters, of the Hamilton College Observatory, the following note, commenting on my note in the BULLETIN lately. He was "reminded of the hedges in Sicily and of the impenetrable cactus fields on the lavas of Mt. Etna. It is the plant first of all used to break down the lava beds. A handful of soil is put down, and a cactus joint (or leaf) thrown upon it. That soon takes root, and the rock weathers very fast. So that, after a few years, as the second plant for aiding in making vegetable soil, fig trees are set out. I liked the fruit of the catcus very much."

You may remember that Dr. Peters made the first thorough survey of Mt. Etna, before 1840, at the expense of some German duchy. His survey is quoted in Humboldt's Cosmos. I. H. H.

§ 237. **Rediscovery of a lost Sphaeria.**—On returning from a botanical excursion in the dusk of the evening, one day last February, I picked up near Vineland, on a piece of the cast off bark of a dead maple, what in the uncertain light I took to be a Cyphella or some similar fungus, but which, on a more careful examination at home, turned out to be a *Sphaeria*, agreeing so well with the characters of *S. barbirostris*, Duf., that I was led to believe it to be in reality that species; though, in the absence of any account of the fructification in the description, the question of identity could not of course, be decided with certainty. I concluded, therefore, as the species was originally found in France, to send a specimen for identification to Dr. M. Cornu. Most fortunately, this gentleman happened to have in his possession a small, but authentic specimen, collected by Dufour himself in the year 1832. On a careful comparison, M. Cornu gave it as his opinion, that my fungus was the veritable *Sphaeria barbirostris* of Dufour, which has never before been found since its first discovery in the department of Landes, over forty years ago. In M. Cornu's specimen the perithecia are on the bare wood of oak; in the Vineland specimen they are on the inner surface, and between the loosened laminae of the maple bark—at first buried in the bark, which is soon pierced and thickly studded with the ostiola, which, again, are beset with a thick growth of short yellowish-brown horizontally spreading hairs. The ostiola were in some cases nearly $\frac{1}{4}$ of an inch long, but mostly about half that length. The asci are cladate-cylindric, and about .002′ long—sporidia oblong-cylindric, hyaline, and mostly about .0003′ long, by about half as wide.

It may be noted here that *Peziza hypnicola*, (Vol. 6, p. 134, Bull. Torr. Club), turns out to be a Lichen—Gyalecta.

Newfield, N. J., May 16, 1878. J. B. ELLIS.

§ 238. **Lygodium palmatum. Southern localities.**—To the specification on p. 221, I am enabled to add the following:

1st. Transylvania Co., N. C., on the table land of the Blue Ridge, on the road from Buck Forest Hotel to Cæsar's Head, a few miles north of the State line. Here it was seen (growing abundantly in the copses by the way-side,) by Dr. Gray, Dr. Engelmann, Mr. Canby and myself in Sept., 1876.

2d. Rockcastle Co., Ky., about 100 miles S. E. from Louisville. In the mountains of this county Mr. John Williamson has recently found a new locality where "a cliff 25 or 50 feet high, and about 200 yards in length is literally overgrown with this fern, every available shrub or bush forming a support for it to twine upon." Mr. Williamson, in his work upon the Ferns of Kentucky, now in progress, will doubtless give us full details concerning this and other interesting fern localities of that State.

May 16, 1878. JOHN H. REDFIELD.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club.* 25 *cents. Address*, WM. H. LEGGETT, 54, *East* 81*st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money,*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER, *the President of the Club.* ***may be found at* 245 *Broadway.***

§ 239. **Vitis.**—*Vitis cordifolia* L., and V. *riparia*, Michx., are still mixed up in the opinion of many of our botanists, and trouble them, whenever they are obliged to touch them. The observations made this spring have again confirmed my long settled conviction of their absolute specific difference, and may help others to better distinguish them.

Vitis riparia was in bloom here in the last week in April, and in favorable localities (on the rocky, sun-exposed banks of the Mississippi,) even before the 20th of that month. *V. cordifolia* bloomed fully four weeks later, and even into this month of June, long after *Labrusca*, and a little before *aestivalis*. As this spring was an unusually early one, it is better to compare their flowering with that of well know trees; thus *riparia* bloomed after the apple-tree, and about the time when the first garden roses and the first Acacia (Robinia) blossoms made their appearance; *cordifolia* bloomed when the flowers of Ailantus exhaled their nauseous odor and Catalpa blossoms were just opening.

The young, half-grown leaf of *riparia* is glossy shining (on the upper surface) and is supported by a pair of conspicuous, white, membranaceous stipules, oblong or linear-oblong, two or three lines in length; the mature leaf is scarcely wrinkled, and of a bright deep green color, and usually has a broad, at the base truncate, sinus.

The leaf of *cordifolia* is always dull, even when young, perfectly smooth, and paler green, and its rounded short stipules are mostly less than one line in length; the sinus, though it may be wide, is always acute.

I need not repeat that the shape of the leaves in typical specimens is distinct enough, but that forms occur, which, without the help of other characters, it would be difficult to keep apart; and this made undoubtedly the great difficulty in the distinction of both species.

There is generally a hairy (rarely cottony, as in *Labrusca* and *aestivalis*) pubescence on the under side of young leaves especially along the ribs; more so in *cordifolia*, less in the other species; in the former this pubescences sometimes remains throughout the season, and rarely even verges to the arachnoid down of *aestivalis*.

In this neighborhood *riparia* matures its fruit in July and August, further north in September, earlier than even *aestivalis; cordifolia* not bfore October.

Now, having distinguished the species, let us see about their geographical distribution. *Riparia* is the northern and western, *cordifolia* the southern and eastern form; in the middle or central States they both occur together. I have found *riparia* on the great Lakes, on Niagara, on Lake George, and have it from Vermont; it is common in Missouri and Illinois, and extends to the Rocky Mountains of Wyoming, Colorado and New Mexico. How far south of the Ohio it is found I have now no means of ascertaining.

V. cordifolia is common throughout the Middle and Southern States, but I have seen no specimen north of New York, nor west of Missouri.

I may add that *V. aestivalis* extends through the whole Vitis region of North America, from New England to Texas and from the

Atlantic to the great plains, but not to the mountains beyond. *V. Labrusca* is our most local species, being confined to the Alleghany Mountains and the region between them and the Atlantic, unknown in the Mississippi Valley or beyond. Whatever has been called so there, or in Louisiana or Texas, is a large and downy leaved form of *aestivalis*, always readily distinguished by its "intermittent" tendrils, while *Labrusca* has more or less "continuous" tendrils.

Will local botanists assist me to more accurately define the geographical limits of our species of Vitis? And may I request them to collect fertile flowers as well as sterile, the only ones found in most herbaria?

ST. LOUIS, June. G. ENGELMANN.

§ 240. **Botrychium simplex, Hitch, in Mass.**—I have received from Mr. E. S. Wheeler of Berlin, Mass., a specimen that proves to be good B. simplex Hitch. The specimen represents Milde's "*forma incisa*" and was found growing with a few others in a sandy plain. This is the first instance of genuine specimens of this rare fern being found in Massachusetts since Dr. Torrey's Deerfield specimen—date unknown—many years ago, and its rediscovery now will give to our botanists an additional stimulus to exert themselves still further in the search for additional stations.

Since I sent the above I have personally verified the rediscovery. There were in all about 125 plants growing on an exposed sandy plain, where the spores may have been blown from some of the higher hilly regions of the surrounding country. The specimens were all small, and it would seem as if the station could not have been there a very long time, probably, allowing three years growth from spores, and two for the largest form above ground, not more than five or six years, or there would have been some more fully developed plants.

I am now desirous of obtaining southern and western forms of all of our Botrychia and will be very grateful to any one who will favor me with specimens.

If I can make any return it will afford me much pleasure to do so. GEO. E. DAVENPORT.

§ 241. **Herb. Mass. Hor. Society.**—The collection of N. American Ferns which I have prepared for this Herbarium being about complete, I now propose adding to it the remaining *Vasculur Cryptogamic* plants of the United States, and respectfully solicit specimens from the botanists of the country for that purpose. Any specimens sent will be thankfully acknowledged, and placed in the Herbarium with donor's name and ticket, and, whenever possible, I shall be glad to supply any desiderata.

GEO. E. DAVENPORT, 8, Hamilton Place, Boston, Mass.

§ 242. **Musci Appalachiani. Supplement I.**—Tickets of 100 specimens of Mosses collected mostly in the Eastern part of North America, by Coe F. Austin, Closter, N. J., price 25 cents. Mr. Austin's supplementary collection is now ready for distribution, at $6 the hundred species, each represented by from ten to fifty specimens.

§ 243. **New Localities.**—Mr. Hall writes us that he found, about the middle of the month, quite a bed of *Lipparis liliifolia*, Rich., quite near Larchmont Station, N. H. R. R. We are reminded, thereby, that a lady showed us this spring from Premium Point, in the same neighborhood, *Smilacina stellata*, Desf., *Uvularia perfoliata*, L., and *Castilleia coccinea*, L. Mr. Le Roy showed us lately where *Bellis perennis*, L., had established itself in the grounds of Columbia College.

§ 244. **Townsendia.**—I have received a dozen or more fresh specimens of Townsendia Wilcoxiana, first noticed in the BULLETIN, Vol. 6, p. 163. They come from Dr. T. E. Wilcox, U. S. A., Camp Supply, Indian Territory. They conform precisely with the *one* original specimen, and description. All bear simply one head. None show any tendency to lose or shorten the pappus of the ray florets, which is quite as copious as that of the disk.

This genus was founded chiefly on the inequality of the pappus in the ray and disk. Now in this new species, this inequality vanishes, and the question arises, can the genus be still maintained? Are there other distinctive marks between Townsendia and Aster? There are. Our plant, like other Townsendias, is distinguished by its remarkable habit, being stemless, with the leaves and head closely radical. The involucre scales are scarious-edged, fringed, and colored, never green-tipped. The rays are bifid at end, the disk corollas *white* with the five teeth brown, never yellow. Pappus bristles flattened and barbellate; and other differences. It is certainly not an Aster. ALPHONSO WOOD.

§ 245. **When the Leaves appear.**—The following table of observations made by Mr. N. L. Britton is a good companion piece to that in § 223 on the fall of the leaves. The tables differ a little in the plants observed, we suppose because the observer was separated from his former notes. The observations are of the more value as they refer not to individual plants but to the general appearance of the vegetation on one portion of Staten Island. The table of the number of days during which the plants are bare is particularly interesting. The average period seems to have been a little over 165 days, or more than 5 months. Cephalanthus is without leafy covering 49 days more than the average; Paulownia, 28; Juglans nigra, 25; Ailanthus, Catalpa, Negundo, each 19 days. Paulownia and Ailanthus are exotics, and the others except Cephalanthus are perhaps out of their proper region, but Cephalanthus, which far exceeds the rest in its period of hibernation, is certainly at home here. Of those that keep their leaves the longest, the Lilac exceeds the average, 45 days; Baccharis, 44; Salix Babylonica and Prunus Cerasus, each 31; Viburnum Lentago, Myrica cerifera and Salix alba, each 25 days; Sambucus Canadensis, 23; and Quercus palustris, 20 days. Of these nine, four are exotics. The greatest difference between Lilac and Cephalanthus is 94 days, about 3 months. There are 65 plants enumerated. Of 16 of these the hibernating period is not given. Lilac is in leaf 246 days, Cephalanthus 152 days. Sixty per cent. about 200 days. It is interesting to notice that Rosaceae keep their leaves a longer time, and Amentaceae (forest trees), except Quercus, a shorter time than the average.

Explanation.—The observations were made once a week, beginning March 10th, 1878, but for convenience of printing, the four March observations have been put into one column, the others in pairs, excepting May 4th. The ——— before a note refers it to the later period, after a note, to the earlier date. A vertical line | separates the earlier from the later observation in that column.

	MARCH 10-31.	APRIL 7TH, 14TH.	APRIL 21ST, 28TH.	MAY 4TH.	MAY 11TH, 18TH.	Without leaves. Days.
Clematis Virginiana		Shoots ½—1½ in.	Lvs. 1½-2. | Shoots 5-8 in.	Vine 1½-2 ft	5-6 ft. Leaflets 2 in.——	
Liriodendron Tulipifera		Buds 1 in	Lvs. 2-3 in. across	3-4 in	Flower buds.———	160
Ailanthus glandulosus			———Started	Lvs. 2-3 in. Leaflets 1 in.	Leaflets 1½ in.———	184
Rhus glabra			Started. | Buds ½ in.	Lvs. 3 in. Leaflets 1 in.	Leaflets 1½ in.———	180
Rhus toxicodendron			Buds ¼ in. | Lvs. 1 in.	Leaflets 2½ in.	———Flowering	160
Vitis Labrusca.			———Started	Lvs. 1 in	Lvs. 2½ in.———	180
Aesculus Hippocastanum		Buds 1-2 in. | Lvs. starting.	Lvs. on some trees 3-4 in. across.———	Leaflets 3-4 in. Racemes 7 in.	Full bloom.———	
Acer rubrum	Buds———full bloom.	———Fruit well formed.	Lvs. ½-1½ in	Lvs. 3 in.		160
Negundo aceroides.		Buds starting.	Lvs. 1 in. | Flow. falling.		Leaflets 2 in.———	184
Robinia Pseudacacia			———Started.	Lvs. 2 in. Leaflets ½ in.	Leaflets 1 | 1¾ in.	174
Wistaria Sinensis			Buds ½ in. | Racemes 2-3in. Lf. buds 1 in.	Rac. 6 in. Lvs. 5 in.	Lvs. 8 in. Full bloom.—	150
Gleditschia triacanthos				Started	Leaflets ½-1.———	180
Prunus Persica (Peach)		———Partly in flower.	Full bloom. | Lvs. 1-½1 in.	Lvs. 2½ in.		
Prunus maritima.			—Some bushes in flower.	Lvs. starting	Full bloom. | Lvs. 2½ in.	
Prunus Cerasus (Cherry)	———Buds ¼ to ½ in.	———Buds opening	Full bloom. | Lvs. 1-3 in.	2 4 in		134
Prunus serotina.	———Starting	Buds ¼ in. | Lvs. ½-1 in.	Trees vary, ¼-2 in.	Lvs. 1½ in. Rac. 1½ in.	Lvs. 2-3 in. Rac 1¾ in.—	154
Rubus villosus.	———Buds ½ in.	Lvs. ¾ | 1½ in.	1-2 in.———	Leaflets 1½-2½ in.		
Rosa Carolina		Lvs. ⅓ in.	Lvs. 1-1½ in. | Lf'lets ¾ in	Leaflets 1¼ in.		160
Crataegus Oxyacantha.		———Buds ⅓ in.	Lvs. 1-1½ in.———	2 in	Full bloom.———	
Crataegus Crus-galli			Buds ½ | ¾ in	Lvs. started.	Lvs. 1-2 in.———	
Amelanchier Canadensis	———Started	Lvs. ½-¾ in. | Well in flower.	———Flowers fallen. Lvs. 1-1½ in.	Lvs. 2½ in.		153
Pyrus Malus (Apple)		Starting	Variable. Some lvs 1½ in ——Some trees in flower.	Full bloom	Lvs. 4 in. Flowers off.—	
Pyrus prunifolia (Crab)	———Buds ¼ in.	Lvs. starting	Lvs. 1-2 in. | Full bloom.	Lvs. 3-4 in. Flowers falling.		
Cydonia Japonica	Flower buds | Partly in flower. Lvs. ¾ in	Lvs. 1 in. | Full flower.	Lvs. 1-1¾ in. | Flowers gone.	Lvs. 2½-3 in.		
Liquidambar Styraciflua			Started. | Lvs. ½ in.	1½-2 in.	3 in.———	167
Cornus florida		Starting | Buds ⅓ in.	Some bracts ¾ in.———	Full flower.	Full flower. Lvs. 1-2 in.—	180
Nyssa multiflora			———Starting	Lvs. ½ in	Lvs. 1-2	164
Lonicera sempervirens	Lvs. ½ , ¾ | 1¾ | 2 in.	———Nearly full grown.	Flower buds ½ in.	1 in. Upper lvs. becoming connate.	——Coming into flower.	
Viburnum Lentago	Buds ½ in. | Floral lvs. 1⅛ in.		Lvs. 1-1½ in.	Lvs. 2 in.	2-3 in. Full bloom.	140
Viburnum dentatum			Started. | Lvs. 1 in.	Corymbs ¾ in. across. Lvs. 2 in.	——Flowers nearly out.	177

Sambucus Canadensis	——Lvs. ½ in.	¾-1¾ in.	2½-3 in.	Terminal leaflets 2 in. Others 1¼ in.		142
Cephalanthus occidentalis			——Starting.	Lvs. 1 in.	2-3 in.	214
Baccharis halimifolia			Lvs. ½. 1 in.		Lvs. 2 in.——	121
Iva frutescens			Started. Lvs. 1 in.		Lvs. 1½ 2 in.——	
Vaccinium corymbosum	—— Buds ⅛ in.	Buds ¼ in. In flower.	Lvs. ½ 1 in. Full bloom.	Lvs. 2 in	Flowers falling.——	154
Ilex verticillata			——Lvs. ½ in.	1 in.	1½-2 in.	167
Catalpa bignonioides				Starting	Lvs. 1½-2 in	184
Paulownia imperialis				Starting	Fl. buds 1½ in. Full bloom. Lvs. 1½ in.	193
Forsythia viridissima	——Buds ½ in.	Full bloom	——Lvs. 1½ in. Flowers falling.		Lvs. 2-3 in.——	
Syringa vulgaris	Buds ½ ¾ in. Lvs. starting.	——Racemes 2 in. Lvs. 1-1½ in.	Rac. 3½ in. Lvs. 1-3 in.	Full bloom		120
Sassafras officinalis		Buds ½ in.	——Full bloom	Lvs. 1½ in. Flowers nearly gone	Lvs. 2-3 in.——	160
Lindera Benzoin	Buds well started Some flowers.	Full bloom	Leaf buds starting	Lvs. 1 in		172
Ulmus Americana	Well in bud. Full bloom.	Flowers nearly off.	Lvs. ½-1½ in.	1-3 in		166
Platanus occidentalis			——Started.	Lvs. 1½ in	2-2½ in. In flower.——	180
Juglans nigra			——Starting	Lvs. 2 in	Leaflets 1-1½ in. Full bloom.	190
Carya alba			Buds ¾ in. Lvs. starting	Leaflets 2 in	——Full bloom	166
Carya tomentosa			" " " "	Lvs. 3-4 in. L'flets 1½ in.	——Full bloom	166
Carya amara			——Starting.	Lvs 1 in	Leaflets 1-2 in	174
Quercus alba			Starting. Buds ½-1 in.	Lvs. 1-2 in. Catkins 1½ in	——Lvs. 3 4 in.	164
Quercus palustris			Lvs. 1½-2 in. Catkins 1 in	Lvs. 2½ in	Lvs. 3-4 in. Flowers falling.	145
Castanea vesca			——Started.	Lvs. 2-3 in	3-5 in.——	174
Fagus ferruginea	Starting. Buds ¼ in.		Buds 1¼ in. Lvs. started	Lvs. 2½ in.	3-4 in	174
Corylus Americana	Catkins 2-2½ in Poll. falling.	——Catkins fallen	Lvs. starting——	Lvs. 2 in	2-3½ in.——	
Myrica cerifera			Starting. Lvs. ½-¾ in.	Lvs. 1 in. Catkins ¼ in.	Lvs. 1-2 in. Catkins in flowers.	140
Betula lenta			Catkins 2½ in. Lvs. 1 in	Catkins falling. Lvs. 2 in	Lvs. 3 in.——	166
Betula alba, *var.* populifolia			Catkins 1-1½ in. Lvs. ½-1½.	Lvs. 2 in	——Lvs. 2 3 in.	173
Alnus serrulata	Catkins mature——falling	All off.	Lvs. ¼-¾ in.	1-1½ in	2-3 in	160
Salix discolor	Catkins ¾ in. —— Some in flower.	Full bloom——falling.	Off. Lvs. ½-1 in.	1-2 in	2-3 in.——	167
Salix alba	——Twigs very green. Started.	Catkins ½-1¼ in. Lvs. ½-1 in.	Lvs. 1½-2½. Flowers falling.	Lvs. 3 in.		140
Salix Babylonica	—Budding — Buds ¼ in.	1 in.	Lvs. starting	Lvs. 1½-2 in		134
Populus tremuloides			Catkins 2½-3 in. Lvs. ½ in.	Lvs. 1 in	2½ in.——	167
Populus balsamifera	Starting——Buds 1¼ in	Catkins 1½ in.	Lvs. 1-2 in	2-4 in		170
Larix Americana		Started. Lvs. ½-¾ in.	1 in	Lvs. full grown.		
Juniperus communis			New lvs. ⅓ ½ in.		¾ in.——	
Smilax rotundifolia			Starting——	Lvs. 1 in	——In bloom	180

§ 245. **Publications.**—1. *Field and Forest.* The Jan. and Feb. Nos. give some account of the Flora of Martha's Vineyard and vicinity, by Rev. Thomas Morong; the March No., Addenda to the Flora Columbiana, 1084–1142. Mr. Ward has found *Polypodium vulgare* growing on the living bark of Betula nigra, several feet above the base, after the manner of *P. incanum.* 2. The *Botanical Gazette* for February and March concludes Dr. Chapman's long list of new Southern (chiefly South Florida) plants. Dr. Vasey describes *Poa Lemmoni*, a new species from Sierra Co., Cal. Mr. Bebb finds that *Salix cordata*, var., *glaucophylla* of Babcock's Chicago catalogue, corresponds so closely with *S. Barclayi*, And., that either the latter should be reduced to *S. cordata*, or the former to *S. Barclayi*, var. *grandifolia.* S. Barclayi was found by Kellogg in Alaska. Mr. J. Wolf gives a list of 61 Lichens of Southern Illinois. Several writers discuss the question "Whence the seeds" of plants that seem to spring up spontaneously in new clearings Mr. Lemmon writes on the Flora of the Great Basin. In the April No., among many interesting notes, including Bryological by Mr. Austin, and Mycological (new Colorado Fungi) by Mr. Peck, we find Mr. Curtiss recording Mistletoe parasitic on itself, and Dr. Rothrock recommending a convenient dissecting microscope, made by Zentmeyer, of Philadelphia, for fifteen dollars, or sixteen dollars with an extra lens. In the May No., Dr. Gray accepts Mr. A. Common's description of two forms of the common Plantain; *P. Major*, L., the smaller obtuse form; *P. Rugelii*, Decaisne, the larger acute form, with leaves generally smooth; spikes longer, tapering to a point, pods longer and larger, opening below the middle, seeds larger, black, not wrinkled, sepals decidedly narrower, and more strongly keeled. Mr. Mohr gives a list of foreign plants introduced into the Gulf States. In the June No., Prof. Wood gives an interesting list of Indian Territory plants, some of which are new. Prof. Porter records the seed of Datura Tatula coming up for ten years after the parent had been extirpated. Mr. Davenport finds polygamous flowers in Populus. Dr. Kunze scouts the idea of Monotropa's being poisonous to the touch, and suggests, as is probable, that the poisoning was due to root fibres of Rhus Toxicodendron. Mr. Broadhead writes on the distribution of certain plants in Missouri. Truly a Botanical Gazette. 3. The *American Naturalist*, for March, publishes an essay by Dr. J. M. Anders on the transpiration of plants. This was a prize medical essay, and is not only of value in itself for careful research in a field not yet well explored, but in giving evidence of advance in the aims of our educational institutions. The "Rambles of a Botanist" (Mr. Greene) in New Mexico, will attract alike by their matter and their manner. A. W. Bennett gives an account of M. Rodier's discovery of a rhythmical movement in Ceratophyllum demersum, which we may all observe this Summer for ourselves; for what water plant more common than Ceratophyllum, what apparatus so ready as a glass of water? Choosing a branch with the intermodes elongated and the whorls distant, and the leaves nearly at right angles to the stem, and when the axis is nearly erect, the axis is seen to bend regularly, curving more and more for six hours, then back again in twelve hours to its original position, then in the opposite direction four hours, and then back to its first position in four hours more, making its swing in about twenty-six hours. The oscillations continue several days, and appear to be independent of light. The April No. continues Mr. Greene's Rambles, and has also a plate showing Welwitschias growing in a plain on the coast of Angola. Mr. Bennett gives some account of the fossil fungus found in a Lepidodendron. In the May No. Prof W. J. Beal treats of hairs and glandular hairs of plants, their forms and uses. In the June No. the same writer notes his experiments in cultivating Hepaticas. One stem bore two flowers near the top, and another three. From Trimen's Journal is drawn a summary of Otto Kuntze's work, to which we have before referred, but which we have not seen. It is on the means by which plants are protected from animals, unfavorable weather, &c., and we judge contains highly interesting observations. Mr. Lester F. Ward has an elaborate article on the genealogy of plants, in which he criticizes the usual classification and offers the following: I. PHAENOGAMS. A. **Angiosperms.** 1. Dicotylae (exogenous). 2. Monocotylae (endogenous). B. **Gymnosperms.** 1. (exogenous) *a.* Gnetaceae, *b.* Coniferae. 2. (endogenus) Cycadaceae. II. CRYPTOGAMS. A. **Lepidophyta.** 1. Dichotomeae: *a.* Ligulatae, *b.* Lycopodiaceae. 2. Equisetaceae (?). B. **Filicineae.** 1. Rhizocarpeae. 2. Filices. His corresponding genealogical lines are: I. LINE OF THE LEPIDOPHYTES. Primordial Cryptogams: Lepidophytae: Dichotomeae [Lycopodites, &c.]: Ligulatae [Isoetes, &c.]: Coniferae: Gnetaceae: Dicotylae. II. LINE OF THE FERNS. Primordial Cryptogams: Filicineae: Rhizocarpeae [Marsilia, &c.]: Cycadaceae: Monocotylae. The typographical form of these tables, lettering, numbering, &c., are our own, adopted for economy of space.

4. *Ferns of Kentucky*, with sixty full-page etchings, and six wood cuts, drawn by the author, by John Williamson, Louisville, Ky. John P. Morton & Co. Price $2.00. In Europe fern lovers are supplied with a great variety of books illustrating their favorites, but in this country we have had nothing except the illustrations in *Gray's Manual.* These illustrations it is true are by Sprague and as far as they go are not likely soon to be surpassed, but they are only intended to illustrate the generic distinctions. The magnificent *Ferns of North America*, edited by Prof. Eaton, now in course of publication, will of course be in the hands of all true pteridophils; but it has only reached the fifth of about twenty parts, and the price though very moderate may deter some from purchasing, who are not yet enough devoted to the subject to deny themselves other gratifications for the purpose of indulging in this. In Mr. Williamson's work, 154 pages, 7¼ x 4½ inches, we have a convenient pocket manual, with blank pages for notes, giving illustrations and descriptions of forty species of ferns. Of the fifty-seven in *Gray's Manual*, of course, the more northern ferns are not found in Kentucky, but two, *Asplenium Bradleyi*, and *Trichomanes radicans*, not there given, are found in Kentucky. Two plates are given of *Botrychium ternatum*, (lunarioides, Manual) viz., var. *obliquum*, and var. *dissectum.*

Two plates are also given illustrating the fertile and sterile fronds of *Asplenium angustifolium.* There are besides plates illustrating the fructification of every genus described, and finally a reproduction of Mr. Davenport's illustration of the vernation of Botrychium, which appeared in the January number of the BULLETIN. Plate II. illustrates the mode of fertilization, *prothallus*, *antheridia*, *archegonia*, partly from nature, partly from other authors. The book is provided with index and introduction. The latter treats of the Structure (Pl. I.), Fertilization, Collecting and Drying and Classification ; and gives a Key to the Genera. Mr. Williamson is a devoted admirer of the beauty of vegetable forms, he is also a botanist and an artist, and has learned to etch that he may exhibit his favorites. The etchings have, however, been transferred to lithographic stones for purposes of economy, but he thinks without loss. Of course, on pages of so small size, only the smaller ferns can display all their natural grace and delicacy; yet it is surprising how much of loving care can be discovered even in most of the larger ones. The artistic treatment of many of the subjects is admirable. It is not often that science and art are so happily blended.

5. *Contributions to the Botany of North America*, by Asa Gray, Proc. Am. Acad. XIII. 361. It seem that we have four species of Elatine; *E. Americana*, the only one found on the Atlantic border, but occurring also in Colorado and Oregon; *E. Californica*, on the Sierra Nevada; *E. triandra* and *E. brachysperma*, from Illinois and Texas westward; they are chiefly distinguished by their seed. Dr. Gray distinguishes two new Genera of Acanthaceae; Carlowrightia and Gatesia. Seventeen new Astragali are described. Galium margariococcum and Arnica viscosa were discovered or distinguished last summer by Gray & Hooker. Actinella Brandegei, T. C. Porter, is to take the place of A. grandiflora, var. glabrata, in Porter & Coulter's Flora. Actinella biennis is the occasion of some critical remarks on the genus. 6. *List of Fungi found in the vicinity of Boston*, Part II., June, 1878, by W. G. Farlow. A valuable critical notice of several fungi of the author's favorite families. 7. *Diseases of Fruit-bearing Trees. (From the 25th Annual Report of the Mass. Board of Agricult.)* Particularly relating to the Fungi on the Cherry family and Vine. 8. *On the Synonymy of some species of Uredineae*, by W. G. Farlow, Proc. Am. Acad. Feb. 13, 1878, relates chiefly to the synonymy of some of the Fungi, in the list referred to above, No. 6. 9. We have received from Gustav E. Stechert, 766 Broadway, N. Y., a valuable catalogue of botanical works for sale by List & Francke, in Leipzig, from the library of the late distinguished Professor Dr. A. Braun of Berlin.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents ; three copies for one dollar, or twelve for three dollars. Vols. I.–V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*, 25 *cents. Address*, WM. H. LEGGETT, 54, *East* 81*st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the last Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER, *the President of the Club*, ***may be found at*** **245** ***Broadway.***

BULLETIN OF THE TORREY BOTANICAL CLUB.
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§ 246. Some Rambling Notes on Collecting and Preserving Herbarium Specimens.

III. **Collecting Specimens.**—In the previous article the necessary outfit for herborizing was considered; in this I propose to offer a few hints on *collecting*.

Plants may be collected at any time while in flower or fruit. The writer has frequently gathered and preserved fine specimens that were put into portfolio when dripping with moisture from a rain or a heavy dew. In such case, early transferring to press and change of driers is quite necessary. The best time, however, I have found is in the morning shortly after the dew has disappeared. The plants are then fresher, and when of a sensitive nature, as are some of the Leguminosæ, the Cruciferæ and others, the leaves are less likely to curl (for later in the day, if dry and sunshiny, it will be found quite difficult to put the specimens into portfolio quick enough to prevent the leaves or petals from rolling), the corollas are generally fully expanded, and fugacious petals, like those of Helianthemums, are more likely to adhere when in press. Of course this does not apply to a few plants, as *Silene noctiflora*, and some of the *Œnotheras*, that open only at night or in cloudy weather.

Care should be taken to have the specimens of the proper size,—neither too small nor too large,—and consist of all that is necessary to make a complete botanical specimen,—flowers, fruit, leaves, stem and root when possible.

In the early part of his course the inexperienced collector is inclined to think that a small sprig containing a flower or two with a few leaves will answer all purposes as a botanical specimen, but later when he comes to identify his plant by the scanty materials he has gathered, he finds recognition quite impossible, and that the flower is only *one* of the component parts of a complete specimen, and not always the most important one. Too little attention is paid, however, even by older botanists, to the collection of the *fruit* and *roots*, the former especially, as most specimens (save those of herbs where the flowers and fruit are found together) received in exchange are wanting in this important requisite. In many genera and orders the fruit is the most distinguishing characteristic, as in the Potamogetons, the Cruciferæ, the Umbelliferæ and the Cyperaceæ, and is quite indispensable for an absolute determination of the plant in hand, while in those rather difficult genera to the young beginner, the Asters and Solidagos, and in some others, the lower leaves play an important part as scientific characters in distinguishing species. And again in others it is the root or root-stem; of the former, whether it is an annual, biennial or perennial and its various shapes; of the latter, the divers forms it assumes, as rhizoma, tuber, bulb. Consequently all these parts are important in a herbarium specimen, and each and all, when necessary should receive due consideration from the botanist when collecting.

Endeavor to obtain specimens that exhibit flowers and fruit in the same plant, and when this is not practicable, the fruit may frequently be secured from more advanced specimens at the same time.

In most cases of herbs one or the other way will be found possible. If not, fruit must be collected later, as in the case of shrubs and trees, of which generally only a branchlet with flowers, or flowers and leaves, can be gathered at first; and subsequently the fruit and mature leaves, which should be taken from the same individual as the flowers.

A specimen should be so arranged as to be no larger when pressed than can be neatly mounted on the common size of American herbarium paper, 16½ by 11½ inches. This may not be the best size of mounting paper that could have been selected for a common standard, yet inasmuch as it has been adopted by most of the leading botanists and colleges of the country for their herbariums, it would be well if all American botanists at least should conform to this standard. Its general adoption would probably facilitate exchanges and contribute to an advantageous disposal of private collections when the owners thereof have finished their botanical careers; or in other words it would probably do much to prevent at that time the breaking up and often the total waste of such private and local collections,—frequently of high intrinsic value and gathered together with care, patience, assiduity and perchance much expense, —and facilitate their incorporation with the permanent herbariums connected with our societies, schools and colleges.

Herbaceous plants not over three or four feet in height should generally be preserved entire, root and all. This can be done by bending or breaking—not entirely off—at one, two or three places. If broken twice it may be arranged something like a capital N, when put in portfolio. Very large plants will have to be divided and preserved separately; or, better still, take a convenient portion of the upper stem having leaves, flowers and fruit, with a sufficient part of the lower stem containing lower leaves, and root enough to show whether annual, biennial or perennial. Thick roots, tubers, bulbs, etc., should be pared down, but in such a manner that their original shape can be easily determined. Good typical specimens and of average size should be selected as representatives in the herbarium;—although overgrown and dwarf specimens, as well as sports and abnormal growths are of value to the physiological botanist, and if peculiarly striking should be carefully preserved. The variation *from the specific type* which many plants show opens a wide and interesting field for careful investigation and merits the thoughtful attention of every intelligent observer.

It will be found an excellent plan for the collector to keep a record of the time of flowering and fruiting of the different plants and when the best specimens may be obtained in his vicinity. This will be found of great help to him in following seasons. Seasons may vary much in regard to earliness, as for example, the fore part of the floral season of 1878 in Dutchess County was three weeks earlier than in 1877, that being perhaps an average season in this region; yet, if the collector knows the relative time of flowering or stages of growth of a group of plants the previous year, and now ascertains the time when one or more of them are in the same stage of bloom as then, he will have no difficulty in telling quite accurately when all the rest of the group will be in flower or similar stage of growth. The time of flowering of different species in relation to each other (*Synchronism*), particularly those growing together in the same situations, is a matter that never seems to have had enough attention called to it, although well worthy of the careful study and observation of the collector. A more intimate knowledge of this subject doubtless would throw considerable light on the relation of many allied species and their varieties. The writer has kept a tabulated account of the relative time of flowering of many such groups for a number of years, and aside from its practical advantages in collecting, he has found it opens to him a field of delightful research, interest and speculation.

We will close this article with a few special directions on collecting certain plants.

As previously intimated, of *Asters* and *Solidagos* be careful to collect lower leaves as well as flowers and fruit. With *Potamogetons* the mature fruit is of first importance, both lower and floating leaves (if any) should be collected.

Carices should be always collected when the achenium matures,—just before the fruit is sufficiently ripe to fall away, and the same applies to the remainder of the Cyperaceæ, but it would be well to have of these also earlier specimens in flower.

The Grasses as a general thing should be gathered as specimens much younger than Cyperaceæ, for, when too old, the spikelets in many species break up and fall away when drying,—the specimen being worthless or badly mutilated. It is well to collect in flower, and also a short time afterwards. Young botanists often think that the head or panicle is all that is required in Sedges and Grasses, and frequently send only that portion when they wish their collections named. This is an error. The culm and leaves (of Grasses in particular) should always form a part of the specimen, and the root when not too large. In several genera the root is quite important.

The culms of most Sedges and Grasses act stubbornly when bent for arranging in portfolio or press and are not apt to stay in place. This can be easily remedied by a sharp bite with the teeth at the angles where bent. But when a number of specimens are to be held together in a little package,—as is a good way to preserve small Carices,—let the angles when bent be pressed through slits in pieces of paper, and dried in that manner. Such species as are cespitous, growing in tufts, should be so collected and preserved, if not too large, so as to show this characteristic.

The willows are diœcious, so sterile and fertile catkins will have to be secured from different bushes. Each species should be represented by four pieces, first the twigs when sterile and fertile catkins can be obtained, (when the respective bushes should be marked, and later corresponding twigs with mature leaves and stipules, and fruit from the fertile plants. These remarks on the willow are applicable to most diœcious shrubs and trees.

There are a few aquatic plants which are so soft and flimsy, as the Lemnaceæ, Potamogeton pectinatus, P. Tuckermani, and Naias gracillima, that to secure them in their proper shape they should be placed in clear water and floated out by running under them, the paper on which they are to remain permanently,—either the regular mounting paper, or a thinner white kind, which when dry can be pasted on the common herbarium sheet.

Finally, but first in importance, as you collect and put in portfolio, be particular to write the name of each species, if known, but by all means, the locality and date of collection, with any other descriptive remarks regarded necessary, on one of the lower corners of specimen sheet. On no account neglect this important point to your subsequent regret and the impairment of the specimen. This should be written as you are putting in press or portfolio. Labels, if preferred, can be used, instead of writing on margin of specimen sheets.

§ 247. **Conomitrium Julianum.**—July 22d I had the good fortune to find an abundance of this rare and curious moss in full fruit. It was on the inside of a walled-up spring a few rods West of Mt. Carmel Station, Hamden, Connecticut. The moss grew in thick tufts, like some alga, just at the water's surface, and beneath it. It also was found lining a barrel some rods away, whither the water is conducted from the spring. Taking my gatherings home, and floating them out to mount, as one does a seaweed, I found the sides of my dish covered with hundreds of the detached capsules, just as Dr. Schimper relates to have happened with Mr. Noellner, when he collected the same plant in 1839 in Baden. Since the water in a spring or stream is drawn up a little at the margin by capillary attraction, just as in the dish I employed, it is probable that these little capsule float up to the extremest edge of the water, and that there the spores germinate and grow. I will send specimens to any persons asking for them. D. C. EATON.

§ 248. **North American Lichenography.**—In the Proceedings of the Essex Institute, Salem, Mass., of Dec. 9, 1867, the writer gave a list of publications in this country on North American Lichens. Following is a continuation of that record to the present time, with additions to the preceding period.

H. N. BOLANDER. A catalogue of the plants growing in the vicinity of San Francisco, 1870, Lichens, p. 41.

A. T. DRUMMOND. Additions to the Canadian Lichen Flora, in Canadian Naturalist, March, 1874.

W. R. GERARD. Notice of the finding of *Omphalaria pulvinata*, Nyl., in Poughkeepsie, N. Y., in TORREY BULLETIN, Dec., 1875.

E. HALL and J. WOLF. Lichens of Illinois in Bulletin No. 2 of Illinois State Laboratory of Natural History, June, 1878, p. 27.

F. W. HALL. List of Lichens within twenty miles of Yale College, in American Naturalist, March, 1877.

JOHN MACOUN. Lichens of British Columbia, in Report of the Geological Survey of Canada, 1877, p. 227.

C. H. PECK. Notices of New York Lichens, in 22d Report of the Regents of the University, 1869, pp. 37, 38, 57–69; 23d Report, 1872, pp. 33, 45 ; 25th Report, 1873, pp. 83, 92 ; 26th Report, 1874, p. 47 ; 27th Report, 1875, p. 83 ; 28th Report, 1876, pp. 38, 42.

EDWARD TUCKERMAN. Lichens of the U. S. Exploration of the 40th Parallel, Washington, 1872, p. 412. Genera Lichenum, Amherst, 1872. Two Oregon Lichens, in TORREY BULLETIN, April, 1874. A catalogue of plants growing without cultivation within thirty miles of Amherst College, Amherst, 1875, Lichens, p. 521. Lichens of Kerguelen's Land, in TORREY BULLETIN, Oct., 1875. Observationes Lichenologicae, in Proc. Am. Acad., Boston, 1876, p. 166. In addition to these may be noted a communication from Prof. Tuckerman in the Regensburg Flora for 1875, p. 63, claiming the priority of the name *Lecidea melancherina*, Tuck., Syn. p 68, and Exs. No. 138, over that of *L. elabens*, Fr., in Th. Fr. Scand., p. 554.

H. WILLEY. Lichens under the Microscope, in Am. Naturalist Jan., 1871. The Spores of Lichens, in the same, Feb., 1871. A list of North American Lichens, New Bedford, 1873. Statistics and Distribution of North American Lichens, in Bulletin Buffalo Nat. Hist. Society, Oct., 1873, p. 161, List of Illinois Lichens in Botanical Gazette, Hanover, Indiana, Feb., 1877, and March, 1878. Lichens collected by Dr. Coulter in Colorado, in 6th Report of the Geological Survey of the Territories, Washington, 1872, p. 790. Lichens of Colorado, in Synopsis of the Flora of Colorado, by Thomas C. Porter and John W. Coulter, Washington, 1874, p. 161. Article on Lichens in Johnson's New Cyclopædia, 1876, Vol. II, p. 1766.

Article on Lichens in Appleton's Cyclopædia, 2d Edition, p. 1876. Author not known.

Additions to the former period:

ELIAS DURAND. Lichens in Plantæ Kaneanæ Grœlandicae, in Journal of Philadelphia Acad. of Nat. Sciences, 1856, p. 204.

EDWARD HITCHCOCK.. Catalogue of plants growing without cultivation in the vicinity of Amherst College, Amherst, 1829, Lichens, p. 55.

I. A. LAPHAM. Lichens, in Additions to the Flora of Wisconsin, in Trans. Wisconsin State Agricultural Society, 1860. p. 8.

JOHN L. RUSSELL. Remarks on the Cryptogamia of Chelmsford, in Proc. Boston Soc. of Nat. Hist., 1840, and Am. Jour. of Science, 1840, p. 183. Some Cryptogamic plants of Mt. Kearsage, in Hovey's Magazine of Botany and Horticulture, 1840, p. 140. Notice of plants about Lynn and Danvers, Mass., in the same, 1850, p, 102. Notice of plants, (including Lichens,) in the same, 1852, p 203.

H. WILLEY.

§ 249. **Veratrum Woodii,** Robbins.—The enclosed item is interesting to me. I first saw the plant in Linton, Green County, Indiana. I next received a few specimens from Dr. Cozzens, Iowa, without locality. Now, the third time after twenty-five years, it turns up in Allenton, Mo. The flowers are almost perfectly black showing in the sunshine a faint sheen of purple. A. W.

ALLENTON, Mo., *Aug.* 5, 1878.

Dear Sir:—I have just found Veratrum Woodii in great abundance along the south bank of the Meramee River, Jefferson Co., Mo., and within thirty miles of St. Louis. Now in bloom. Dr. Englemann pronounces it the genuine Woodii.

Yours, G. W. LETTERMAN.

§ 250. **Campanula aparinoides,** Pursh.—Rev. Mr. Welch, of

Windsor, Conn., finds *Campanula aparinoides*, with four and five stigmas, say out of 109 specimens 61 with four stigmas, twenty-nine with three, and nineteen with five stigmas. Has any one else noticed this? A. G.

§ 251. **Rafinesque's Lechea.**—In the absence of other matter, attention is invited to this much neglected monograph, which, with all its faults, is a real addition to our knowledge of that little noticed and difficult genus. One species at least, described sufficiently for identification, has been overlooked during all these years, and some points important for distinction seem here first to have been used, The introduction is abridged, and some varieties omitted, otherwise the monograph down to the end of the specific descriptions, is copied entire from the New Flora of North America, Part I., Philadelphia, 1836. My object in calling attention to it at this time, which is most seasonable for gathering specimens, is to solicit the assistance of collectors, particularly in the regions referred to by Rafinesque for many of his species. A good specimen of Lechea should have the mature capsule, the sterile stems, *i. e.*, the prostrate or assurgent shoots which spring from the base of the stem when the fruit is about mature, and stem leaves if possible. Specimens in earlier flower are also desirable, chiefly for the form of growth and the more abundant stem leaves, as flowers are generally to be found till the end of the season.

MONOGRAPH OF LECHEA.

Linnaeus had only two species of Lechea. His L. minor and L. major have been applied at random by nearly all the botanists to any other species, till Michaux added three species. I shall now increase it to 21 species and divide it into 3 subgenera.

Characters of LECHEA. Calyx double and persistent; external, bipartite, seldom lacking [never], sepals narrower; internal, tripartite. Petals 3, small, narrow, equal, obtuse and fugacious. Stamens 3 to 12, filiform; anthers bilobe. Stigma large, sessile, capitate, trilobe, floccose or plumose or papillose. Capsule unilocular, trivalve; 3 to 9 [6] seeds inserted on 3 small free placentas, sometimes only one by abortion. *Small annuals or perennials, with terete stiff branching stem; leaves ternate or opposite, scattered, simple entire and subsessile; flowers aestival, evanescent, paniculate or racemose, not yellow.*—Vulgar name Pin-weed.

I. MENANDRA, Fl. Virg. of Gronovius. External calyx with two short sepals or almost lacking. Stamens 6 to 9; seeds 1 to 3. *Leaves often ternate, and flowers racemose. Perennials.*

II. LECHEA. External calyx equal in length to the internal. Stamens 6 to 12; seeds 1 to 3; flowers spicate, some stems *sterile.*

III. EUDIEXA, Raf., (well 2 external). Exterior calyx longer than the internal. Stamens 3 to 6; seeds 3 to 9 [?]. Chiefly annuals.

The mistakes about these plants have arisen from few botanists seeing their anthesis or full bloom, which only lasts a few hours towards noon; the petals soon after wither and the stamens collapse or are glued to the stigma. But the characters now assumed on the persistent respective length of the calyx will always be perspicuous. I have specimens of all the described species.

[Sub-genus I.] **Menandra.**

1. **L. pulchella,** Raf. Quite smooth; stem stiff virgate; leaves scattered, long linear, acute: flowers paniculate and lax in naked racemes; bracts none; exterior sepals subulate, internal ovate, obtuse; petals elliptic, obtuse, incarnate; capsule obovate.—In the Pine-barrens of New Jersey, probably extending South. Probably the *L. racemulosa* of many botanists, but not Mx., which is pubescent with ciliate leaves. It is a very pretty species when in full bloom in August, the calyx being red inside, the petals incarnate, the large stigma white. The erect stiff stem produces hundreds of flowers at once, it is about one foot high, and only branched above. Several varieties; 1. *Minor*, only 2 to 4 inches high, panicle leafy; 2. *Elegans*, over a foot high, panicle fastigiate; 3. *Pyramidalis*, branches pyramidal. [L. minor, Lam ?]

2. **L. cinerea,** Raf. (L. thymifolia, Mx., etc.) Adpressed pubescent, cinereous fastigiate; leaves scattered, narrow linear adpressed; racemes paniculate, pauciflore, subnaked; flowers canescent outside, sepals lanceolate acute; capsule oblong, longer.—In Florida and Georgia: deemed *L. racemulosa* by Collins, easily known by its color, perhaps the real *thymifolia*. [L. Torreyi, nob.]

3. **L. ternifolia,** Raf. (Menandra ramis ternis, Gronov.) Stem paniculate above, adpressed pubescent; leaves and branches mostly ternate, cuneate, acute, ciliate, nearly smooth; racemes paniculate, lax, nearly naked; peduncles elongate, capsules oblong. In Virginia, New Jersey, and probably elsewhere. This must be the real *racemulosa* of Mx., who quotes Gronovius. Pedal; calyx colored of red as in *L. pulchella*. [L. racemulosa, Mchx. ?]

4. **L. furfuracea,** Raf. Pubescent pulverulent; stem erect; branches fastigiate above; leaves narrow, linear, scattered, nearly obtuse; racemes terminal, naked; pedicels unequal; exterior calyx subulate, very short, internal rounded; capsules globose.—In Kentucky and Illinois, 6 to 10 inches high; flowers greenish outside with a yellow furfle [scurf]. Nearest to *L. cinerea*, easily known by the mealy pubescence and globose capsules. [Unknown.]

5. **L. laxiflora,** Raf. Smooth; stem erect paniculate; branches lax; leaves scattered, linear, cuneate, acuminate, ciliate; racemes scattered, lax; flowers remote, naked; pedicels elongate; calyx and capsules ovate.—In New Jersey Pine Woods with *L. pulchella*, to which akin; difference in leaves chiefly, flowers green not red outside. [L. minor, Lam. ?]

6. **L. tenuifolia,** Mchx., Elliot, or L. verna, Raf. (L. juncifolia, Walter). Humble, dumose, pilose; stems assurgent; branches spreading; leaves scattered, subulate, linear, ranemes paniculate, divaricate, flowers remote, axillary, solitary; capsules globose large. —Said to grow on the R. Santi of Carolina, and to blossom earlier than any other, in April and May. No external calyx according to Elliot, yet very near to some *Eudiexa* with long external calyx.

7. **L. recurvata,** Raf. Hispid assurgent; branches opposite and ternate: leaves broad oblong, acute at both ends, ciliate; racemes spicate recurvate, unilateral; pedicels very short; sepals oval; capsules globose.—In Carolina and Virginia; akin to L. ternifolia

(perhaps the true Menandra of Gr.) leaves and fruit different; calyx reddish; seeds convex and concave. [?]

[Sub-genus II.] **Lechea.**

8. **L. mucronata,** Raf. precis, 1814; villosa, Elliott, 1820; major of Walter and Mchx., not of Linn.—Villose; stem erect, sterile stems prostrate; leaves opposite and ternate below, chiefly lanceolate, mucronate, on short petioles; flowers in compound spikes, axillary to foliaceous bracts; exterior sepals acute, reflexed in anthesis, internal sepals obtuse; capsules ovate, villose.—From New England to Carolina, the most common species, but not the Linnean *L. major* with leaves rough above tomentose beneath, and scattered flowers, which is the real Cistus Canadensis! [Helianthemum.] Flowers subsessile; exterior sepals linear, adpressed in the fruit; internal sepals lanceolate; petals lanceolate, obtuse; commonly 3 seeds, oblong, acute, with an angle inside, Several varieties. . . . . 3. *sessiliflora*, leaves lanceolate; petioles very hairy, branches fastigiate spikes axillary and short, flowers sessile, from Missouri. All perennials.

9 **L. heterophylla,** Raf., L. minor, Smith. Stem paniculate above, adpressed pubescent, leaves commonly ternate; lower obvate, subsessile; upper cuneate and linear petiolate, acute, smooth; racemes paniculate, lax, sub-naked; pedicels equal to flowers; internal sepals lanceolate, acute, carinate; capsules ovate.—Kentucky and Illinois in woods and glades; trigone; exterior sepals subequal, linear. Several varieties [&c.] It has no sterile stems. Perennial. [?]

10. **L. glomerata,** Raf. Smooth; branches short adpressed; leaves variable oblong, lanceolate or cuneate, petiolate, mucronate; flowers axillary and terminal on short pedicels, glomerate; sepals ovate, acute, carinate; capsules subglobose.—Appalachian Mts.; pedal, no sterile stems, calyx trigone over the fruit, external sepals linear. Perennial. [?]

11. **L. corymbosa,** Raf. Stem erect, rough, above pilose corymbose; leaves petiolate, broad oblong, nearly obtuse, pubescent, ciliate; flowers corymbose; pedicels equal to flowers; sepals round concave, exterior linear; capsules globose.—Mts. Alleghany, 6–12 inches high, leaves small; capsules large with 3 to 6 seeds; discovered 1818. [?]

12. **L. surculosa,** Raf. Stem with spreading branches, sterile stems prostrate, pilose, with leaves ternate, ovato-oblong, acute, ciliate, petiolate; branches smooth, with leaves opposite and alternate, smooth, linear; flowers paniculate, pedicels equal, bracts subulate: exterior sepals linear; internal ovate, acute; capsules ovate.—In Pennsylvania on dry hills: the L. minor of some authors; stem 3 to 6 inches; leaves and flowers small. [L. minor, Lam ?]

13. **L. revoluta,** Raf., minor of Linn, not of Smith or other authors. Stem erect; branches opposite and ternate; leaves 3–4 nate or opposite: lower ovate, upper linear lanceolate, scattered, petiolate, smooth above, pubescent below, margin revolute; flowers paniculate.—Found by Kalm in Canada, woody glades. This description is taken from Linnæus altogether, and agrees very well with

some specimens I have from the Alleghanies of Pennsylvania. The flowers are small, the capsules ovate, &c. Smith says L. blended others with this. [?]

14. **L. virgata,** Raf. Stem simple virgate, pubescent; leaves scattered, or 2–3–4 nate mixed, petiolate, linear, cuneate, ciliate, acuminate; racemes axillary, short, pauciflore; pedicels equal to flowers; sepals ovate, acute, carinate, external linear; capsules ovate.—In the Alleghany Mts. Pedal, var. 1. *Breviflora*, semi-pedal, lower leaves oblong, short, racemes very short, 2–3 flore, var. 2. *Bracteata*, pedal, lower leaves oblong, racemes longer than leaves, base foliose, end 5–7 flore. The species 9, 10 and 14, with carinate trigone calyx, deserve perhaps to form another gubgenus, TROPENDRIA, Raf. [?]

15. **L. Floridana,** Raf. Smooth, diffuse, ramose; branches filiform; leaves scattered, minute, linear; racemes paniculate, pauciflore, naked; pedicels long, unequal; sepals and capsules ovate.—Found by Mr. Ware in Florida. Small, subdichotome, few leaves and flowers: habit of *Eudiexa*, but the exterior calyx equal in length, though narrower as usual; probably annual. [?]

[Subgenus III.] **Eudiexa.**

16. **L. secundiflora,** Raf. Smooth; stems diffuse paniculate, leaves scattered; lax, narrow, linear; racemes subspicate; flowers remote, secund; pedicels short; exterior calyx double of the internal, linear; internal silky, paniculate; capsules oblong.—Discovered 1823, in the glades of West Kentucky, rare; 6 inches high; small flowers; petals white, oblong, obtuse; stigma red; 3 oblong seeds in the capsules. It blossoms in June and July. Annual. Is it *L. thymifolia*, Smith? which is an Eudiexa! certainly not of Mchx., neither have the leaves like thyme. [L. thymifolia, Mchx.?]

17. **L. pauciflora,** Raf. Adpressed pubescent; stem humble, diffuse ramose; leaves scattered. slender, linear, cuneate, imbricate, rather obtuse; flowers few, scattered, extra-axillary; pedicels short; sepals smooth, external a little longer; capsules globose.—Near the sea-shore in Long Island and New Jersey. Small plant, only 3 inches high; it blossoms in July. Annual. [L. thymifolia, Torr.?]

18. **L. brevifolia,** Raf. Adpressed pilose; branches fastigiate; leaves scattered, petiolate, short, lanceolate or oblong, ciliolate, mucronulate; racemes erect; bracteoles linear lanceolate; flowers secund; pedicels equal; exterior sepals not much longer; capsules ovate.—Mts. Apalaches; semi-pedal; very distinct species by petiolate short leaves. Annual. [?]

19. **L. uniflora,** Raf. Smooth; stem slender, angular with few leaves, above naked; subuniflore; leaves scattered, adpressed, narrow, linear, cuneate; sepals membranaceous; exterior sepals oblong obtuse, not much longer; internal ovate obtuse; capsules globose, about 6 seeded.—Summit of the Alleghany Mt.; discovered 1825; only 3 or 4 inches high; only 5 or 6 leaves, and 1 or 2 flowers. Capsule commonly with 6 oval seeds. [?]

20. **L. stellata,** Raf. Pilose; stem erect, nearly simple; leaves 3–4 nate, petiolate, elliptic, mucronate; upper leaves alternate, lanceolate; racemes foliose; pedicels shorter; exterior sepals very

long; capsules ovato-oblong.—New York and Ohio; often mistaken for *L. villosa;* pedal, aestival; sepals linear and ovate. [L. thymfolia, Mchx., L. Nova-Cæsarea, Aust.]

21. **L. sessiliflora,** Raf. Adpressed pilose: branches diffuse virgate; leaves scattered. spreading, petiolate, linear, ciliate, acute; flowers axillary, subspicate or glomerate, sessile; exterior sepals linear, not much longer; internal lanceolate.—In Florida and Alabam, near to *L. pauciflora*, main difference leaves petiolate, ciliate, acute. Near also to *L. Floridana*, but flowers sessile. [?]

Notes on Rafinesque's Monograph.

It would appear that Rafinesque has been in too great haste to multiply species, and to give names of his own without regard to priority. In charity we must allow that, as regards the latter fault, the rules of nomenclature were not clearly settled in his day, and in both, if he has sinned in the case of this difficult genus, others have done the same. He has the merit of pointing out the value of the length of the exterior sepals as a distinctive mark, and of trying to make out the species of prior writers, although discarding their names.

Probably all species of Lechea in bud have the exterior sepals longer, but as the flowers mature the inner generally surpass the outer. Only in one species, in my knowledge, are the outer persistently longer than, and in three or four equal to the inner. I suspect Rafinesque has formed some of his species on the flowering stage. It is not safe to decide till the fruit is mature.

It will be noticed that in his generic description he repeats the character, seeds 3–9, but mentions no species with 9 seed. Normally there should be 6 seed, but the number varies from 1 to 6, and is perhaps of secondary value for distinction. I doubt whether any Lechea is annual.

1. *L. pulchella.* Twice, in different years, in about the same spot near Pleasant Mills, in the New Jersey Pines, in company with Mr. J. S. Merriam, I have met with an abnormally smooth Lechea which answers pretty well to this description, except that we did not see the full bloom, and cannot vouch for the white stigmas. I took it for a local sport of what we call L. minor, Lam., some of which regularly pubescent I think we found not far off, though this latter species does not abound, I think, in the Pines. If L. minor, it is certainly a singular form.

2. *L. cinerea.* This is a pretty correct description of what I have distributed to correspondents as *L. Torreyi.* However, there may be two distinct forms in Florida, one 3 seeded, the other 6 seeded, and the name *L. Torreyi*, I have hopes, may hold.

3, 5, 7, &c. I shall content myself, in the case of these and most of the species, with the marks bracketed at the end of the description, a name, when I think I recognize it; a query, when quite at a loss.

4. *L. furfuracea.* I have never seen anything to which this description would apply.

6. *L. tenuifolia*, Mchx., is one of the species that have the exterior sepals equal to the inner or a little exceeding them.

17. *L. pauciflora*, this must be a yearling of what our books call *L. thymifolia*, Pursh.

20. *L. stellata.* This is undoubtedly the *L. thymifolia* of Mchx, Pursh, Smith, &c. The *Nova-Cæsarea*, Austin. Species 16, 18, 19, are probably only young plants of the same.

21. *L. sessiflora*, may possibly be *L. patula*, nob., but no species known to me has the mature flowers sessile.

It may not be amiss to indicate here briefly the different forms that I have been able to distinguish, to help those who may be willing to assist me in my efforts to unravel what has been so perplexing a knot.

I. *Leaves of radical shoots elliptical, ovate, or oblong, not more than two or three times as long as broad.*

1. L. major, Mchx., outer sepals about equal in length to inner. Well described in Gray's Manual. I suspect the L. divaricata, Shuttleworth, from Florida, is only a form of this with many stamens, 30 or more.

2. L. thymifolia, Mchx. Distinguished by its long outer sepals, and leafy panicle. I have received a fragment of Michaux's specimen, by the kindness of Prof. Decaisne; Smith mentions the long outer sepals, and Pursh the leafy panicles. Pursh's thymifolia, too, grew in barren, dry woods, on slate hills, not on the sea shore. This is the L. Nova-Cæsarea of the Manual, and is often confounded with L. major.

3. L. racemulosa, Mchx. Easily distinguished by its slender spreading pedicel, oblong flower, and broadly lanceolate stem leaves. Outer sepals shorter.

4. L. thymifolia, of the Manual, but which must receive another name. It has been beautifully figured by Sprague in Gray's genera. It is confined to the neighborhood of the sea, but abounds some miles from it in the Pines of New Jersey. Outer sepals shorter.

5. L. patula, nob. So called from the broadly spreading branches and branchlets in specimens from South Carolina; but specimens since received from Florida are much less spreading. The radical shoots are an iron gray, assurgent with small oblong leaves. The flower is perhaps the smallest of the genus, the outer sepals about equal to the inner. I have been scarcely able to find good seed among my specimens, as the fruit seems unusually exposed to injury.

II. *Leaves of radical shoots lanceolate, much longer than broad.*

6. L. tenuifolia, Mchx. This is generally low and spreading, the capsules are large and conspicuous. The inner sepals even when broad, have only a mid rib, and no side veins, all the other species have more or less distinctly 3 veins, or ribs, rising from the base. The outer sepals about equal the inner in length.

7. L. minor, Lam., so called, but apparently without good reason. In the Manual is described the form found in the vicinity of New York and in New Jersey. On the uplands of Pennsylvania, New York and New England, and in Canada a form prevails with shorter more upright branches, and larger more clustered flowers, and more globular capsules, in Northern

Illinois, Iowa, and Wisconsin, a form of a paler colar, longer, strict, or fastigiate branches, and smaller capsules; all have the outer sepals shorter. Perhaps they may all be varieties of one species.

8. L. cinerea, Raf. There is apparently another form, with more fulvous pubescence, and six seed, which is possibly distinct. Outer sepals shorter.

9. L. Drummondii, Spach., probably belongs here, being closely related to L. tenuifolia. Outer sepals about equal.

10. L. Cubensis, nob., may also belong here. It was found in Cuba by Charles Wright, has thread like leaves, and I believe outer sepals about equal to inner.

Of the distribution: No. 1 is found from Canada to Florida, and westward, T. & G. say, to the Mississippi. I have specimens from only here and there. No. 2. from New York to Florida and Louisiana. No. 3. from Nantucket to Virginia, and Kentucky. No. 4. I know only along the coast from Massachusetts to Delaware. No. 5. South Carolina and Florida. No. 6. New Hampshire to Florida, Texas, Arkansas, Missouri, Illinois and Wisconsin. No. 7. Canada, Wisconsin, New York, New Jersey, Pennsylvania and Delaware. No. 8. Florida. No. 9. Texas. No. 10. Cuba.

I repeat my request to be furnished with the various forms of Lechea from all the States. W. H. L.

§ 253. **Flora of New Jersey.**—I recently received from Dr. Hexamer, of New Castle, a specimen of *Calluna vulgaris*, Salisb.

This plant has been found growing without cultivation, in Mass., Nova Scotia, and Newfoundland; but was never before known to grow so far south as New Jersey.

The Dr. writes me that he found a few bushes near Egg Harbor. That it should be found in a wild state in New Jersey at all is a thing to be noticed; but that it should be found in its very southern extremity is still more to be wondered at.

I have also a communication from Dr. Porter, of La Fayette College, who informs me that he, in company with Dr. Green, in the latter part of August, made a Botanical excursion to "*Swarts Wooa Lake*," which lies about six miles north of Newton, in Sussex Co. This sheet of water is three miles long and one mile wide. In this little lake they found portions covered with Nelumbium uteum, Willd. Neither of them had seen this plant in a living state before, and we must draw upon the imagination in order to comprehend the emotions of two enthusiastic Botanists when beholding such a sight.

The Dr. stated that some of the leaves were spread out and seemed to float upon the surface of the water, while others were elevated from one to two feet above. The season of flowering was past. The flower stalks, however, like some of the leaves, rose two feet above the water. [Vide. Grey's Manual.]

On this same excursion they found *Nasturtium lacustre*, Gray, which was seen for the first time so far east and south. Also, *Bidens Beckii*, Torr., not before reported from New Jersey.

I collected, myself, *Drosera rotundifolia*, L., at Lyonsdale, Lewis County, N. Y., at the falls of the Moose River, growing in the crevices of the rocks. O. R. WILLIS.

§ 254. Some Rambling Notes on Collecting and Preserving Herbarium Specimens.

IV. **Drying Specimens.**—In these notes we have endeavored to follow, in a measure, the mythical Mrs. Glasse's celebrated recipe for cooking a hare:—"First catch your hare." We have collected our specimens, or, in other words, attempted to show how they should be collected properly, and now the next thing is to prepare them for the herbarium, the chief requisite being to extract the moisture as rapidly as possible from the green plant.

There are two principal methods in use among botanists for drying plants,—the first, which is the one usually followed, is by *absorption*, where pressure is used and change of driers (drying paper) is necessary. The other mode, which is of more recent introduction, is by *evaporation*: the wire-netting press containing the specimens is hung in the open air; the drying being done through the agency of the sun and wind, no changing of driers being required until the plants are cured.

Which is the better of the two methods is open to considerable difference of opinion. The latter mode is very simple and demands much less labor than the other after the plants are once in press; while with the other to dry the specimens properly demands assiduous care and attention during the whole time they are pressing. The *wire-press* will probably answer a very good purpose for those who wish to collect in a small way as they travel, but as most botanists like to collect extensively, this press seems hardly adequate to the demands likely to be made upon it, particularly on such occasions as frequently occur to the writer, and perhaps to most botanists, when, returning home from a several days, collecting trip, he finds a thousand or more specimens in his box and portfolio *clamoring* for immediate attention.

In regard to the quality of work turned out by this press, my experience has not been entirely satisfactory. My specimens have generally shrivelled more or less, and the quality has usually been not above second-rate. I tried it faithfully for part of one season, along with my other presses, and then abandoned the evaporating process. Feeling my disappointment keenly, as my expectations had been considerably raised, I may possibly have discarded it too soon; for my ill-success may be owing to not having mastered fully certain details, the knowledge of which, however simple, is necessary to the working of every system. But I understand that the experience of a few others coincides with my own, and it is also fair to state that I have never seen specimens, even when dried by the warmest advocates of the wire-press, equal in quality to those preserved by the other method.

While the personal experience of the writer is decidedly in favor of the old-fashioned press, as his *evaporation* friends term it, let it be not inferred that he has any hobby to ride in this matter. He has no sincerer wish than to see his favorite science a popular study with his young contemporaries, and no more cherished purpose in these notes than to clear up and make even, a little, the road that leads to the portal of this charming department of natural science.

If specimens of as good quality, and in as large quantity, in the same time, can be dried this way as the other, then it certainly is a great improvement in preparing our herbarium specimens, and it would do much towards making collections popular among botanical students, as the labor in drying is undoubtedly less than half. Unfortunately such merits in workmanship cannot at present be fully conceded. However, this press ought to prove a great boon to those botanists desirous of making a collection of dried plants, and yet having very little time in which to do it, and particularly to that class alluded to in a former article, who put their specimens in one of the old kind of presses and then give themselves no further trouble. One of these wire-presses, if used, could not fail to improve their specimens greatly, although the necessity of bringing the press inside at the approach of night or a storm might, perhaps, be to them an unconquerable objection.

To Prof. A. Wood belongs the credit of first calling the attention of American botanists to this method of drying plants by evaporation. For some time, however, the wire-press has been in use in some parts of Europe. Whether Prof. Wood borrowed the idea from the European botanists, or whether to him belongs the merit of the original invention, the writer is not prepared to say. At all events, he published, over twenty years ago, in one of his text-books, a description of this method of drying plants by evaporation by means of a wire-press hung in the open air. In an article in the BULLETIN of March, 1872, he again refers to the subject, claiming for this method a great improvement over the old process. By request of an eminent European botanist, this article was republished in BULLETIN for April, 1877. As Prof. W. is a distinguished champion of this method, I shall quote his description of the press from his "Botanist and Florist." "The drying-press, to be most efficient and convenient, should consist of a dozen quires of unsized paper, at least 11x14 inches folio; two sheets of wire-gauze (same size) as covers, stiffened by folded edges; and three or four leather straps, a yard in length, with buckles. When in use, suspend this press in the wind and sunshine; or, in rainy weather, by the fire."

In the article referred to, Prof. Wood speaks somewhat enthusiastically of the advantages attained: "It dries by evaporation rather than absorption and thus makes available all the sources of heat, whether natural or artificial. It requires comparatively but little paper—less than half the amount needed in the old process; hence it is portable, and serves the double purpose of portfolio and press. It requires no changing of specimens and papers, no drying of damp and mildewed sheets. After one or two days the specimens will be found thoroughly cured, and as bright in colors as is possible by any other known method. To the travelling collector this form of press is invaluable. With it so light is his labor in drying his specimens that it occasions him little, if any, delay, and so light his luggage that a single donkey will suffice in lieu of half a dozen for its transportation. With this simple press the writer, during a single year, cured more than three thousand specimens, in a protracted journey of about fifteen hundred miles."

During the present year, Mr. Roessler of New Haven, Ct., has perfected a handy press, which he calls the "Portable Wire Plant-press." It is similar in design, but in convenience and general effectiveness is perhaps an improvement on the one described by Prof. Wood, having an ingenious arrangement for fastening quickly and securely. Prof. Eaton, of Yale College, recommends it highly and says: "I have found that, by the use of a press of this kind, even kelps and rockweed [*marine Algae*] may be readily dried, especially if the press be placed in a current of heated air, as, for instance, over a common hot-air register." The reasonable price at which the press is offered —$1.75 each—will probably give it a large sale. The size of the press is 16⅝ by 11½ inches. It would be well for those botanists intending to use it to have two presses, one for a collecting portfolio, the other for a press.

As most of our space has been devoted to the wire-press, I shall defer consideration of the other method, with the writer's way of managing his green specimens, until another article.

§ 255. Plants introduced with ballast and on made land.

Since the publication by Aubrey H. Smith, Esq., in 1867, of his "Notes on some colonies of Plants," in the Proceedings of the Academy of Natural Sciences of Philadelphia, increased attention seems to have been given to the observation of plants introduced through the agencies of commerce. In 1877, Mr. Burk published in the same Journal a list of 125 foreign species collected by himself and Messrs. Parker and Martindale, during the ten years previous, from the docks and ballast deposits at Philadelphia, including those given by Mr. Martindale in the Botanical Gazette for November, 1876. In the latter publication, in August, 1877, Mr. Martindale mentions some 36 species collected during that year, including a few not previously observed; and in May, 1878, Mr. Mohr, of Mobile, gives a list of some 64 species collected by him about the ballast-grounds of Pensacola, during the ten years preceding, embracing about a dozen foreign species not in Mr. Burk's list. Although quite a number of plants that have been for several years more or less widely established in our N. Y. District are included in all the lists above referred to, there remain at least a hundred new immigrants, chiefly through ballast deposits, found during the last ten years, and not hitherto reported within our local boundaries.

From the vast commerce of New York it might be supposed that a proportionately large number of new plants would be found appearing in our neighborhood through similar agencies. But our crowded wharves and the rapid improvement of waste or filled-in lands have not usually permitted deposits of ballast to remain undisturbed long enough for the growth of plants. It is probable, nevertheless, that our local botanists have not been as alert as might be in seizing such opportunities for observation as have occasionally arisen.

Some ten years ago the Central Rail Road of New Jersey filled in about 300 acres of New York Bay, extending south-westerly from Jersey City to Communipaw. The new land thus made runs about three-quarters of a mile in length westwardly from the Company's Depot and Ferry Landing, by about a half mile in breadth. It was filled in to a level of about two feet above the highest tides with promiscuous material of sand, dirt, gravel, ashes and cinders, with the garbage and refuse of the city, dredgings from the docks, and such ballast deposits as chance intermingled with the rest. The surface of most of the tract has lain undisturbed for several years past, without additional deposits, and it is now mostly grown over with turf and weeds. About the wharves and near the Ferry Landing some ballast is occasionally deposited, and another portion serves still as dumping ground for rubbish of every description.

My attention having been directed to these grounds last autumn, I determined to observe its flora this season, so far as leisure would permit. I have, accordingly, visited them about once in two weeks, beginning May 14th (a month later than intended) with the results given below. Many of these visits were in company with Mr. M. Ruger, or Mr. W. H. Rudkin, by whom a number of the species were first detected. A few were found near the wharves and recent deposits, the great majority were obtained in the undisturbed, overgrown, waste fields, where they seem to be permanently established. Some 24 of these species (printed in capitals) are not in Gray's Manual; and these, with 10 additional species (in italics) are not mentioned in the local catalogue of the BULLETIN; or, if mentioned, were there ascribed to stations already destroyed.

As "new species" were found at every visit, I have no douht that a more careful search would have considerably increased this list. The more common plants of the neighborhood, including the seaboard Asters, Solidagos, Pluchea, Helianthi, &c., are not included.

Many of the plants are undoubtedly from ballast; others from seeds among city refuse. A few garden plants from this last source have been inserted, as it was obvious from the places where gathered that they had maintained themselves for several seasons. Where not otherwise noted, the plants are believed to be of English origin; by "European" is meant from the Continent. Some unrecognized grasses were collected, which are not yet determined.

1. Delphinium consolida, L. *Var.*, AJACIS.—Sept. One specimen. On wharf.
2. PAPAVER RHOEAS, L.—July. In several places.
3. *Fumaria officinalis*, L.—July and Sept. Scarce.
4. *Lepidium Draba*, L.—May. In three dense patches.—L. ruderale, L., and L. campestre, L. May and June. In great abundance.
5. *Thlaspi arvense*, L.—May and June. In profusion over several acres.
6. Camelina sativa, Crantz.—May—July. Abundant.
7. Erysimum cheiranthoides. L.—Abundant. A second growth is now (Sept. 30) in flower and fruit.
8. ERYSIMUM REPANDUM, L.—June. Abundant. European.
9. Barbarea praecox, R. Br.—June—July. Scarce.
10. *Sisymbrium Sophia*, L.—June. Abundant.
11. RAPISTRUM RUGOSUM, All.—July. European. Plentiful.
12. NESLIA PANICULATA, Desv.—June. European. Scanty, near ship yard. Not before reported.

13. POLANISIA VISCOSA, DC.—Sept. Near wharf, half a dozen specimens. East Indian. Reported also by Mr. Mohr from Pensacola.
14. RESEDA LUTEA, L.—July. Scanty.
15. Viola tricolor, L.—July. In several places.
16. Lychnis vespertina, Sibth.—July. In several places.
17. Silene inflata, Smith.—Scarce.
18. Vaccaria vulgaris, Host.—Aug. Near wharf.
19. PORTULACA PILOSA, L.—August. One specimen.
20. Sida spinosa, L.—Sept. One specimen. Southern.
21. GOSSYPIUM BARBADENSE, L.—Sept. Half dozen specimens. Southern States.
22. Melilotus officinalis, Willd., and M. alba, Lam.—June to Oct. In great luxuriance; all mowed down in July but reappearing and blossoming until frost.
23. CORONILLA VARIA, DC.—July. Scarce. European.
24. Vicia tetrasperma, L.—June. Abundant.
25. ARACHIS HYPOGAEA, Willd.—Sept. Half a dozen plants in blossom, from heaps of city refuse.
26. EPILOBIUM HIRSUTUM, L.—Aug. Scarce.
27. CARUM CARUI, L.—May—June.
28. Conium maculatum, L.—May. Abundant.
29. CORIANDRUM SATIVUM, L.—May. Scarce.
30. MATRICARIA CHAMOMILLA, L.—May—July. Abundant. Found also at Weehawken and Hunter's Point.
31. Anthemis arvensis, L.—Sept. Scarce.
32. MATRICARIA INODORA, L.—Sept. Abundant here, and at Hunter's Point.
33. Galinsoga parviflora, Cav.—August. South America.
34. Eclipta procumbens, Michx.—August.
35. *Lampsana communis*, L.—July. Scarce.
36. HYPOCHAERIS RADICATA, L.—August. Scarce.
37. Sonchus arvensis, L.—August. Abundant.
38. CICHORIUM ENDIVIA, L.—July. Scarce.
39. *Centaurea nigra*, L. *Var.* JACEA—one specimen.
40. Artemisia biennis, Willd.—Sept. Abundant at Communipaw slaughter-houses; brought from the West, probably by cattle.
41. Anagallis arvensis, L.—Aug. Both varieties. A caerulea, Sm., most abundant.
42. Convolvulus arvensis, L—Aug. Abundant.
43. ASPERUGO PROCUMBENS, L.—May—June. Abundant in several patches. Only one specimen reported by Mr. Martindale, at Philadelphia.
44. Lithospermum arvense, L.—May—June. Abundant here and elsewhere about New York.
45. Echinospermum Lappula, L.—June. Abundant.
46. Echium vulgare, L.—July. A few specimens.
47. LINARIA SPURIA, Mill.—Aug. Abundant in one locality.
48. LINARIA MINOR, Desf.—Aug. With the last, but less abundant.
49. VERBASCUM VIRGATUM, With.—June. One specimen only. Not hitherto reported.

50. STACHYS ANNUA, L.—Aug. With the last.
51. Galeopsis Tetrahit, L.—Aug. Near office; soon cut down.
52. Verbena officinalis, L.—July. Specimens few but in several localities.
53. Chenopodium glaucum, L.—Sept. Abundant. Not uncommon elsewhere about New York.
54. Chenopodium Botrys, L.—Sept. Abundant.
55. ATRIPLEX ROSEA, L.—Aug.—Sept. Abundant.
56. *Amarantus spinosus* L.—Sept. Near wharf. Southern States. [Sometimes picked up in less built-up streets of New York.]
57. *Amarantus hypochondriacus*, L.—Sept. A few scattered specimens.
58. CELOSIA CRISTATA, L.—Sept. Scarce.
59. MERCURIALIS ANNUA, L.—Sept. Scarce. Near wharves.
60. Cannabis sativa, L.—July—Sept. In great abundance and luxuriance; mostly cut down in midsummer, but reappearing yearly in undiminished quantities.
61. TEUCRIUM SCORDIUM, L. Reported by Mr. Ruger.
62. Erodium cicutarium, L. Her. " " " "
63. ERVUM LENS, L. Reported by Mr. Ruger.

Nos. 1, 8, 12, 38, 49 in the above list, have, it would seem, made their first appearance at our port.

NEW YORK, *Sept.* 30, 1878. ADDISON BROWN.

§ 256. **Long Island Plants.**—I take pride in reporting the following plants from here, not before noticed in the BULLETIN, to wit: *Potamogeton pulcher*, Tuck., River Head. *P. pusillus*, L. var. *vulgaris*, Mert. & Koch, Wading River. *Eleocharis tricostata*, Torr., Wading River. *Sagina apetala*, L., Stoney Brook. *Ranunculus multifidus*, Pursh., Wading River. *Utricularia subulata*, L., *Ceratophyllum demersum*, L. var. *echinatum*, in fruit, River Head. *Salix nigra*, Marsh. *S. lucida*, Muhl., Wading River. *Lemna perpusilla*, Torr.

I have concluded to make up sets containing fifty species of the rare plants of Long Island, and send them by mail post-paid for $4 the set. They will contain fifty from the following list:

1. Ranunculus ficaria.
2. Barbarea praecox.
3. Viola pedata *var.* alba.
4. Lechea tenuifolia, Mx.
5. Hypericum Canadense, *var.* major.
6. Arenaria peploides.
7. Sesuviun pentandrum.
8. Althaea officinalis.
9. Sagina apetala.
10. Galactia mollis.
11. Prunus maritima.
12. Rosa micrantha.
13. Myriophyllum tenellum.
14. Œnothera fruticosa, *var.* humifusa.
15. Oldenlandia glomerata.
16. Sericocarpus solidagineus.
17. Aster flexuosus.
18. A. linifolius.
19. Solidago elliptica.
20. S. neglecta.
21. Coreopsis rosea.
22. Cirsium horridulum.
23. Plantago pusilla.
24. Utricularia inflata.
25. U. minor.
26. U. intermedia.
27. U. striata.
28. U. gibba.
29. U. purpurea.
30. U. clandestina.

31. U. subulata.
32. U. resupinata.
33. Mentha aquatica *var.* crispa.
34. Stachys hyssopifolia.
35. Limnanthemum lacunosum.
36. Asclepias incarnata *var.* pulchra.
37. Blitum Bonus-Henricus.
38. Callitriche heterophylla.
39. Alnus glutinosa.
40. Juniperus communis *var.* depressa.
41. Zannichellia palustris.
42. Ruppia maritima.
43. Potamogeton Oakesianus.
44. P. pulcher.
45. Muscari racemosum.
46. Eleocharis Robbinsii.
47. E. rostellata.
48. E. melanocarpa.
49. E. tricostata.
50. Scirpus subterminalis.
51. S. Olneyii.
52. Fimbristylis spadicea *var.* castanea.
53. Rhyncospora nitens.
54. R. macrostachya.
55. Scleria reticularis.
56. Bromus tectorum.
57. Panicum amarum.
58. Botrychium simplex.

E. S. MILLER.

WADING RIVER, SUFFOLK, CO., N. Y.

§ 257. **Staten Island Plants.**—I send the following unreported localities on the Island.

1. **Dianthus prolifer,** L., and
2. **Heliotropium Europaeum.** L., found by Mr. Hollick in the streets of New Brighton. These, I believe, are new to the State. [But have they established themselves?]
3. **Cerastium vulgatum,** L, Sparingly near Clove Lake. *Hollick.*
4. **C. nutans,** Raf. Abundant in woods near Egbertville.
5. **Polygala Nuttallii,** T. & G. Near Richmond.
6. **Oldenlandia glomerata,** Mchx. Along salt meadows near Richmond.
7. **Archemora rigida,** DC. Swamp near Tottenville.
8. **Liatris scariosa,** Willd. Sparingly near Clifton.
9. **Eupatorium aromaticum,** L. Richmond Hill.
10. **Eclipta procumbens,** Mchx. Side of road leading from Marshland to Springville, about one quarter mile west of the west end of Long Bridge.
11. **Pentstemon pubescens,** Solander. One specimen near Mariner's Harbor. *Hollick.*
12. **Gerardia maritima,** Raf. Salt meadows near Richmond.
13. **Monarda punctata,** L. Abundant in a field three quarters of a mile west of Pleasant Plains Station.
14. **Polygonum ramosissimum,** Mchx. Salt meadows near New Dorp. Only two plants found.
15. **Spiranthes simplex,** Gray. Two specimens were found at Tottenville by Mr. Hollick and myself. [Years ago, we found a single specimen in that vicinity. EDS.]
16. **Stipa avenacea,** L. Tottenville.
17. **Aristida tuberculosa,** Nutt. Near Giffords and Tottenville.
18. **Leptochloa fascicularis,** Gray Salt meadows near New Dorp.
19. **Tripsacum dactyloides,** L. Just at the western end of the "Long Bridge" mentioned in No. 10.

20. **Woodwardia Virginica,** Smith. Swamp near Clifton.
21. **Lycopodium inundatum,** L., *var.* **Bigelovii.** Tottenville.

N. L. BRITTON.

NEW DORP, SEPT. 20th.

§ 258. **Herbarium for sale.**—We are advised by Mr. W. F. Flanner, 230, E. Vermont St., Indianapolis, Ind., that he wishes to dispose of the herbarium of H. B. Flanner, deceased ; that it consists of about 15,000 specimens, representing 4,000 species, chiefly of the Northern and Central States, but with others obtained by exchange with eminent botanists. We believe that any person or institution wishing to form an herbarium would do wisely to address Mr. Flanner.

§ 259. **Rhode Island Plants.**—I have discovered a fine locality for *Lygodium palmatum,* Swartz, in Scituate, R. I. It also occurs in Chepachet. Mr. Geo. Hunt has added *Woodsia Ilvensis*, and *Struthiopteris Germanica* to our R. I. Flora. Mr. Arnold Green has discovered an abundant locality for *Habenaria ciliaris* in South Kingston, while Prof. Sargent, of Cambridge, reports *Cuphea viscossisima* in Tiverton.

Those who have botanized in Rhode Island at any time will confer a favor by communicating their lists either to Mr. James L. Bennett, or myself, at Brown University. We have a catalogue in contemplation, in which Messrs. Bennett, Congdon, and others are assisting. Mr. Bennett started the movement, and the work, no doubt, will be accomplished with his usual accuracy. W. W. BAILEY.

§ 260. **Plants of Western Iowa.**—It appears that this heading, § 220, March No., was incorrect, the plants there mentioned having been found in Central Iowa. Mr. Burgess gave a list of some of his Western Iowa plants in § 106, July and August, 1876. The Plantago mentioned in § 220, we judge to be Mr. Common's newly distinguished P. Rugelii, Decaisne, No. 18, we find is probably Lespedeza leptostachya, Engelmann, described by Gray, Proc. Am. Acad. XII. 57, already reported from that State by Messrs. Arthur and Bessey.

§ 261. **Spring flowers in October.**—Some trees have the habitual weakness of putting out blossoms in late fall. But the last mild fall and the present may produce this debility in others. Last fall we heard all over of apple, and other trees, roses and other shrubs. strawberries, and other perennial herbs, blossoming, and in fact setting a new crop of fruit. We have witnessed something of the same sort this season. Mr. Britton noticed on Staten Island a pear tree with ripe fruit and flowers at the same time. Mr. Merriam writes that the Horse-chestnuts in the City Hall Park have put out new leaves and are in bloom ; that Pear-trees are in bloom at 146th St. and St. Nicholas Ave. ; that the Tartarian Honeysuckle and Persian Lilac are in bloom in Central Park.

Terms—One Dollar per annum beginning with the January number. For the Botanical Directory 40 *cents ; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club,* 25 *cents. Address,* WM. H. LEGGETT, 54, *East 81st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend. DR. THURBER, *the President of the Club, may be found at* 245 *Broadway.*

§ 262. Some rambling Notes on Collecting and Preserving Herbarium Specimens.

V. **Drying Specimens,** *continued*—Our design in this article is to describe, with some detail, the common method of drying specimens, particularly the writer's mode of procedure. In this account he hopes will be found a full answer to those queries which have from time to time been submitted to him, and to whose proponders he now apologizes for any lack of courtesy he may have shown in not giving their polite inquiries an earlier and, perhaps, a more direct reply.

The *driers* or *drying* papers, which we shall describe first, are equally necessary to both ways of curing specimens, though by the wire-press not so many are required, Paper having the quality of imbibing moisture quickly should be used for this purpose. Some kinds of wrapping-paper—usually of light or grayish color—answer very well. Most newspapers are good. Common blotting-paper is admirable, in case you obtain sheets of sufficient size, although it is rather expensive. An excellent quality of drier is sold by several houses who deal in goods relating to natural history, among which is the Naturalists's Agency, Salem, Mass. These driers cost at Salem $5 a ream, which price, with freight or expressage added, makes a moderate outlay to purchasers living at a distance, but the driers are durable and, with careful usage, will last through many collecting seasons.

I have used with great satisfaction these Salem driers, and also, with quite as good success, my own prepared driers or packets made of newspapers. There may be a slight difference in favor of the former; but even with plenty of extra driers on hand, I use these packets largely, for I find them quite indispensable in pressing coarse and succulent plants.

These packets are made in the following manner. I select such newspapers as are more bibulous. The bibulous quality can be readily ascertained by letting a drop of water fall on the paper ; the more quickly the water is absorbed the better the paper for drying purposes. I take two papers of the size of the *New York Tribune*,—the paper of which absorbs nicely and also folds to the size of the Naturalist drier, 18 by 12 inches,—fold them evenly, and fasten together at two of the corners with *McGill's eyelet paper-fasteners*, or else by stitching with a strong thread or cord. This gives me a packet of 16 leaves, which I find the size best adapted for most purposes, although a portion of the packets may be made of 8 and 12 thicknesses. The stitching can be done very expeditiously with a sewing machine. Newspapers of other sizes, can be folded as near the dimensions as possible and then cut to the required size. Wrapping or other paper, if used, should be made, for convenience, into packets like the newspapers.

It is well to have on hand a good supply of drying paper. I have generally found use during the season for three reams of Naturalist driers and nearly half as many packets. Unless you wish to collect liberally for exchanges, you can probably get along with a third of that quantity, or less. Still you will find it poor economy to straiten yourself in this respect, for a good pile of surplus driers never comes amiss on returning from a fruitful botanical excursion, nor during a period of cloudy weather. These remarks are equally applicable to *specimen paper*, which I described and insisted on under "*Outfit*." Lay in sufficient stock of this paper before the collecting season opens, as you can buy it much cheaper in quantity. By a rough estimate from the writer's experience, nearly half as many specimen sheets, for the season, will be required, as the number of specimens to be pressed, in that period: if you expect to dry 5,000 specimens during the season, you will generally want about 2,500 sheets to do it with. Less new stock will be required each successive year, as the old sheets, out of which the specimens were taken in winter for mounting and exchanges, are good for the coming season.

Next provide yourself with a dozen or more pieces of board, 18 inches long and 12 inches wide. They are used at the top and bottom of the pile when pressing, and also for dividing the pile into suitable divisions,—separating the packages of plants which were put in press at different periods, and dividing up the packages themselves if too large. Painted binder's-boards may be used instead of common boards if more convenient to obtain. Instead of either of these, some collectors use a kind of lattice arrangement, the size of the driers, made of two layers of thin strips or laths, nailed across each other. They claim that it permits the circulation of air in the piles and so hastens drying. But when the driers are changed regularly, I have been unable to find any especial advantage in its favor.

For giving pressure various ways have been contrived. The screw press is convenient and compact, but otherwise objectionable, for, although we may give the correct amount of pressure at the outset, (but in fact it is generally too great at first,) yet, as the plants shrink in drying, they will fail to receive the required pressure. This objection does not apply to the lever press, but all that the writer has ever seen, are unwieldy and inconvenient. It is possible, however, some forms of this press might be used with advantage by our less muscular botanists, as it could be so arranged that 10 or 15 lbs. might be made to give a pressure of 50 to 100 lbs.

Fortunately one of the best forms of the drying press, as well as the simplest and cheapest, is merely a board with weights placed upon the top of the pile of specimens. Here, by the simple gravitation of the weights on top, the pressure is continued, and constantly follows up, or rather *down*, the shrinkage of the plants. The weight on a pile should vary from 25 to 100 lbs., according to nature of the specimens and the quantity in the press at the time. On an average 60 lbs. is sufficient for most plants,—rarely should it exceed 75 lbs.; with more than this there is danger of crushing the more delicate parts of the flower especially, and consequently impairing the scientific value. Plants requiring most pressure may be placed at the bottom of the pile, where, in addition to the regular weight, they will have that of the pile above them. From an erroneous idea that the colors are better preserved by using great pressure, some botanists are in the habit of applying as high as 200 lbs. weight to their specimens. Such a great weight is certainly prejudicial to the scientific excellence of their specimens, crushing and jamming together in an undistinguishable mass all the tenderer portions, while all the external excellencies for which they sought could have been fully secured by the moderate pressure recommended.

To supply the weights, various heavy articles may be used, as bars of iron ; a number of stones weighing from 10 to 50 lbs. each, and roped for convenience of handling, if desired; boxes filled with sand, stones, old iron ; etc. The writer has half a dozen or more old fashioned scale weights, with their rings remaining, weighing 14, 28, and 56 lbs. respectively. These, with stones, he finds answer every purpose.

In preparing a package for the press, first lay down two driers, then put on a sheet with specimens, next two more driers, then another specimen sheet, and so on. The number of driers interposed between the sheets of specimens will depend on the thickness and succulence of the plants. On an average two driers are sufficient, but if the specimens are coarse and fleshy, more will be needed,—a *packet* with the driers, or even more packets in drying certain plants with thick stems, large heads, etc. If these packets should not be at hand, uniform pressure may be secured by placing thick strips or cotton batting about the edges of the package. Ringlets of cotton may be used for some of the larger headed Compositæ, if perfect flower specimens are derived. With a little care in adjusting the larger specimens in the package, so that the thick parts are not too much above each other, and with the use of newspaper packets, I have very rarely found it necessary to employ thick strips or cotton to secure an equable pressure. In plants containing little moisture, and in those which part with it readily—as the sedges, grasses and many of the ferns and aquatics—one drier between the specimens, after the first 24 hours, will be all then required, as it will in most of the other plants after the third day, especially if the driers are changed as directed.

For the press recommended, with weights at top, the pile should rarely be carried higher than 18 or 20 inches; if carried much beyond this point, the pile is apt to become shaky and the pressure unsteady : better start another press to hold the surplusage. It is also well not to make the various packages or sections which compose the pile too large,—not over 6 inches in thickness, the writer's are seldom over 4 inches,—as the plants dry better in small packages on account of the pressure being more evenly distributed.

§ 263. New or Little-known Ferns of the United States.
No. 5.

In the first part of the "*Ferns of North America*," when speaking of *Asplenium serratum*, I made the observation that "it can scarcely be rash to hazard the conjecture, that there are yet in the swamps and hummocks of Florida more undiscovered tropical ferns to reward the diligent explorer." I now have the pleasure of announcing a four-fold fulfilment of this prediction.

12. **Ceratopteris thalictroides,** Brongniart.—This plant, which is one of the most peculiar of Ferns, was discovered last July by Dr.

A. P. Garber, growing in the waters of Prairie Creek in South Florida. It is as truly an aquatic plant as *Pontederia* or *Sparganium*, and has been found in still or slowly-moving waters in most tropical and many sub-tropical regions. It occurs in several of the West Indies, in Mexico, New Granada and Brazil, and in Africa, Madagascar, India, Java, Hong-Kong, Australia, the Philippines, etc. The sterile frond varies from a perfectly simple leaf to one which is twice or three times pinnate ; the simpler ones are floating, and are produced early in the season, and the more compound fronds come later, and are emergent. The veins are everywhere finely reticulated. The fertile fronds have very numerous linear, or somewhat pod-like, segments, with the margin reflexed to form a broad and continuous membranaceous involucre. The sporangia are scattered on the backs of the veins, and are sub-globose in form, and are more variable in respect to the ring than any other fern. This organ is sometimes entirely lacking, at other times it is composed of a few obscure joints ; and again it is very broad and nearly complete. So variable is the species that at least four genera and two suborders have been formed for its reception, and, though Hooker placed it at the end of *Pterideae*, its proper position among Ferns is by no means settled. Dr. Garber has as yet found only sterile plants, and it is to be hoped that he may be successful in his search for fruiting fronds.

13. **Cheilanthes microphylla,** Swartz.—In the BULLETIN for May, 1875, I stated that this species was collected many years ago on the Mexican Boundary, but had not been received a second time from anywhere within our limits. Mr. A. H. Curtiss, has now discovered it, growing in considerable abundance, on old shell-heaps on an island near the mouth of the St. John's river, Florida, and will have specimens in his next series of Florida plants.

14. **Asplenium firmum,** Kunze.—Found in a limestone "sink" at Ocala, Florida, by Mr. W. H. Shockley, of New Bedford, Mass., in March last. This is another tropical American fern, which proves to be an inhabitant also of Florida. It has fronds from three to eight inches long, of a firm-membranaceous texture, ovate or oblong in outline, and once pinnate. The pinnae, five to twelve pairs, are variable in shape, being either lanceolate, oblong-ovate, or oval, obtuse, or acuminate, the base more or less excised in the lower side, and truncate (though never auricled) on the upper. The margin is more or less crenated or serrated, the sori moderately elongated, and the rachis slightly winged. The plant is plainly identical with specimens from Kew marked *A. firmum*, and with Fendler's 143 from Venezuela. Concerning the proper specific name there is a good deal of doubt and confusion, which can scarcely be cleared away at present. Mr. Baker considers the species identical with part of Willdenow's *A. abscissum*, and calls the species by that name, and Mettenius seems to have been of the same opinion. But see Hooker's Species Filicum, iii, p. 135.

15. **Asplenium cicutarium,** Swartz.—Found by Mr. Shockley on or by limestone rocks near Lake Panasopkee, Sumter Co., Florida. The fronds are from a few inches to a foot and a half long (in

tropical specimens) and are tripinnate, with winged primary and secondary rachises, and more or less deeply pinnatifid pinnules; the ultimate lobes or teeth having but a single veinlet. The relationship of the plant is to *A. myriophyllum* of Presl, which Hooker has considered to be a variety of *A. rhizophyllum*, but the present fern has less dissected, broader, and more rigid fronds. It is a common species in the West Indies, and in several countries of South America. Mr. Shockley also collected *A. myriophyllum* in Florida, not far from the place where he discovered *A. firmum*.

New Haven *Oct.* 12, 1878. D. C. Eaton.

I am not responsible for a very stupid blunder in one of the last plates of my Fern Book, where "Polopodium vulgare" is printed under a figure of Pol. Scouleri, and again Schizaea is put "Shizaea." /y

D. C. E.

§ 264. **Calluna vulgaris in New Jersey.**—By the kindness of Dr. Hexamer in a letter to Mr. Isaac C. Martindale, Mr. Charles F. Parker, one of the Curators of the Academy of Natural Sciences of Philadelphia, and I were very very well directed to the exact spot where the Calluna vulgaris is growing, about two miles from Egg Harbor City, New Jersey. The appearances are very well calculated to create a first impression that it is indigenous. There is but a single plant, but it has been growing there some years, and the sand has blown in among the branches, and these have rooted, giving the appearance of a mass of plants. All the main branches are what a gardener would call "fan shaped," showing that it was originally planted there,—a bunchy plant having been pressed against a flat surface, as in planting a garden edge of dwarf box. Not far from the plant is a hole, which, though among scrub oak and bushes, might have been intended for a cellar for a small house and from the bottom of which came out a nearly dead peach tree. I could see that the tree was probably eight or nine years old, and I knew the Peach was not indigenous. It led me to inquire, and I found that some twelve years ago a man named Habersak came to those parts from England and intended to build a little house; that he could not pay the ground rent, and went off and left for parts unknown. It is a very common thing for foreigners to bring the heather with them. On the Atlantic last year I saw not a few with these treasures carefully looked after in moss and in pots. I feel no hesitation in deciding that this plant is not indigenous here. If I am not mistaken in the identity, this Mr. Habersak was located near Warrenton, Virginia, four or five years ago, and no doubt, if any one could find him, the exact date of the planting could be got.

Considering how easy it is to be deceived, would it be worth while to go over again the circumstances surrounding other American localities for this plant? One thing we may be sure of, this plant has been brought over from Europe by emigrants for a hundred years or more past. Some would have no place of their own suitable to grow it, would be very likely to "stick it in" somewhere, and, when they left, no one would know of it, as in this case. It will at

1- Sup. 276.

least do no harm to remember this posibility when examining the facts. THOMAS MEEHAN.

GERMANTOWN, OCT. 16.

§ 265. **Rediscovery of Shortia.**—In examining a package of plants from Mr. M. E. Hyams, of Statesville, North Carolina, I had the extreme happiness of finding a specimen of SHORTIA GALACIFOLIA, Gray. This discovery is confirmed by Prof. Gray, who has seen the only two specimens yet found. The plant was discovered last year in McDowell Co., N. C., by Mr. H.'s son, a lad of about thirteen years. This re-discovery of a plant so rare that heretofore only one known specimen existed, that at the Jardin des Plantes, in Michaux's herbarium, which is preserved there, is certainly one of the most important botanical discoveries of the age. Mr. Hyams expects to gather the plant another season, and will probably have specimens for sale at a reasonable price. J. W. CONGDON.

§ 266. **Aspidium marginale,** Swartz.—I have found in several localities in this State forms of a fern which do not agree with any description of A. marginale, Sw., that I have seen, and yet resemble it in manner of growth and general appearance of fruit ; so I suggest the propriety of regarding it as a distinct variety. I submit the following description :

Stipe 1′–3′ long, with copious tuft of lanceolate ferruginous scales at the base ; frond 4′–6′ long, 1½′–3′ wide, once pinnate with lower pinnae deeply pinnatifid, upper merely lobed. Sori usually one at each sinus, rarely two, one on each side of pinnule, Jamesville, N. Y.; Stockbridge, N. Y.; Chittenango Falls, N. Y., growing on limestone cliffs. Specimens have also been sent me from Worcester, Mass. Two mature specimens in my collection, fully fruited, are only five and one-half inches above the rootstock.

LUCIEN M. UNDERWOOD.

CAZENOVIA, N. Y., Oct., 1878.

§ 267. **Ferns of New York State.**—Mr. Benjamin D. Gilbert, in the *Utica Herald* of October 18th, in a notice of Mr. Williamson's "Ferns of Kentucky," writes as follows :

An examination of this volume naturally suggests a comparison of the Kentucky ferns with those of our own State. Mr. Williamson describes 41 species and varieties, of which two have not as yet been found in his State, but are included because a more thorough search will be likely to discover them there. One of these is the very rare *Cheilanthes tomentosa*, Link, a native of both Tennessee and North Carolina, not far from the borders of Kentucky. The other is *Woodsia Ilvensis*, R., Br., which, although belonging farther north, the author thinks may possibly occur among the mountains of Kentucky. This fern is common in New York State, growing upon ledges of rock. One other fern, *Aspidium cristatum*, Swartz, is placed in the book on the authority of a young lady who reported it from a single locality, although Prof. Hussey afterward searched the locality named without success. This fern also grows in New York State, and is met with frequently in swamps, both in the Mohawk valley and on the hills. If we deduct these three species, the number absolutely known to be growing in Kentucky is thirty-eight. Four of these are not to be found in New York State. They are, *Polypodium incanum*, Swartz, common South, but not found in the Northern States; *Asplenium pinnatifidum*, Nuttall, which is reported as plentiful in Kentucky; *Asplenium Bradleyi*, D. C. Eaton, an extremely rare species found only in Tennessee and Kentucky; and *Trichomanes radicans*, Swartz, the Killarney fern, a species widely-diffused throughout the world, although of rare occurrence in America, being found only in Alabama, Tennessee, and Kentucky. This leaves thirty-four species and varieties which are common to New York and Kentucky. But has the former State any ferns which do not appear in the latter? Let us enumerate them. The following list comprises the species and varieties already discovered in this State, which are not known in Kentucky.

Pellaea gracilis, Hooker.
Woodwardia Virginica, Smith.
Woodwardia angustifolia, Smith.
Scolopendrium vulgare, Smith.
Polypodium Dryopteris, L.
Aspidium fragrans, Swartz.
Aspidium spinulosum, Swartz.
“ “ var. *dilatatum*.
“ “ “ *Boottii*.
Aspidium cristatum, Swartz.
“ “ var. *Clintonianum*, Eaton.
Aspidium aculeatum, Sw., and var. *Braunii*, Koch.
Struthiopteris Germanica, Wild.
Woodsia Ilvensis, R. Brown.
Woodsia hyperborea, R. Brown.
Woodsia glabella, R. Brown.
Botrychium Lunaria, Swartz.
Botrychium simplex, Hitchock.
Botrychium lanceolatum, Angst.
Botrychium rutaceum, Swartz.
Botrychium lunarioides, Swartz.

Here is a list of twenty-two ferns native to New York State, which are not found in Kentucky. That is, deducting the four Kentucky species not found here, we have eighteen species and varieties more than Kentucky, making in all fifty-two ferns which grow in the State of New York. No other State in the Union, east of the Mississippi, can show such a list of ferns as this, and in no other are *Scolopendrium* and *Woodsia hyperborea* known to exist. In one other State only, viz., Vermont, has *Woodsia glabella* been found. Our herbarium will verify every species here quoted, except *Aspidium fragrans*, which Professor Peck found at Lake Avalanche, in the Adirondacks, and *Aspidium aculeatum*, which he discovered at Lower Ausable lake and one other point in the mountains. Our specimens of these species came from points farther west. So far as we are aware, no complete list of the New York ferns has been published since Paine's catalogue was issued, and several species have been added since that time. The above list comprises all that are now known as natives of the State, including, of course, the thirty-four species which are common to the two States. Should the time ever come when a separate history of our New York ferns shall be written, it will, or at least it ought, include some curious and interesting bibliography.

§ 268. **The complete list of New York ferns** will be, adopting Mr. Davenport's views about Aspidium spinulosum (Am. Nat. Nov.):

1. Polypodium vulgare, L.
2. Adiantum pedatum, L.
3. Pteris aquilina, L.
4. Cheilanthes vestita, Swartz.
5. Pellaea gracilis, Hook.
6. P. atropurpurea, Link.
7. Woodwardia Virginica, Smith.
8. W. angustifolia, Smith.
9. Asplenium Trichomanes, L.
10. A. ebeneum, Ait.
11. A. montanum, Wild.
12. A. Ruta-muraria, L.
13. A. angustifolium, Mchx.
14. A. thelypteroides, Mchx.
15. A. Filix-femina, Bernh.
16. Scolopendrium vulgare, Smith
17. Camptosorus rhizophyllus, Link.
18. Phegopteris polypodioides, Fée.
19. P. hexgonoptera, Fée.
20. P. Dryopteris, Fée.
21. Aspidium Thelypteris, Swartz.
22. A. Noveboracense, Swartz.
23. A. fragrans, Swartz.
24. A. spinulosum, Swartz.
25. Var. dilatatum, Eaton.
26. A. Americanum, Dav. (Amer. Nat., XII., 714.)
27. A. Boottii, Tuckerman, (ibidem.)
28. A. cristatum, Swartz.
29. Var. Clintonianum, Eaton.
30. A. Goldianum, Hook.
31. A. marginale, Swartz.
    Var. ? ——, Underwood.
32. A. acrostichoides, Swartz.
33. A. aculeatum, Swartz.
34. Var. Braunii, Koch.
35. Cystopteris bulbifera, Bernh.
36. C. fragilis, Bernh.
37. Struthiopteris Germanica, Willd.
38. Onoclea sensibilis, L.
39. Woodsia obtusa, Torr.
40. W. Ilvensis, R. Br.
41. W. hyperborea, R. Br.
42. W. glabella, R. Br.
43. Dicksonia punctilobula, Kunze.
44. Lygodium palmatum, Swartz.
45. Osmunda regalis, L.
46. O. Claytoniana, L.
47. O. cinnamomea, L.
48. Botrychium simplex, Hitch.
49. B. Lunaria, Swartz.
50. B. matricariaefolium, A. Br.
51. B. ternatum, Swartz.
52. B. lanceolatum, Angstroem.
53. B. Virginicum, Swartz.
54. Ophioglossum vulgatum, L.

§ 269. **Sequoia.**—*Harper's* for November contains a very important paper by John Muir upon "The New Sequoia Forests of California," accompanied with ten illustrations of these giant trees. He details the discovery by himself of a grand forest of Sequoia seventy miles long, lying considerably to the south of the isolated groups hitherto known, and containing large numbers of saplings which indicate that the species is still in a vigorous state of existence. It has been argued heretofore that the few groups of these trees known made it probable that the species was dying out from its last strongholds upon the earth—for it has come down to us from pre-glacial times, when it existed in Europe also, as geologic evidence testifies. Mr. Muir's researches lead him to believe that the species has never been more extensively distributed on the Sierra in post-glacial times than it is now. and that to-day it is as full of life and vigor as it was 10,000 years ago.—*Utica Herald.*

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory 40 cents; three copies for one dollar, or twelve for three dollars. Vols. I.–V., with index, and photograph of Dr. Torrey, $3.75. Copies of Constitution and By-Laws of the Club. 25 cents. Address,* Wm. H. Leggett, 54, *East 81st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College, at 7:30 P. M. Botanists are invited to attend. Dr. Thurber, *the President of the Club, may be found at 245 Broadway.*

§ 270. Some Rambling Notes on Collecting and Preserving Herbarium Specimens.

VI. **Drying Specimens,** *continued.*—Although plants, can, if necessary, be kept quite fresh for several days in portfolio or vasculum, it will be found a good plan, on returning from a collecting trip, to transfer them to the home press as early as possible. If left too long in box, many specimens will lose their petals or other delicate parts, and if left too long in portfolio, abundance of moisture will accumulate in the papers from the plants, and after a while fermentation set in, and then, if not quickly attended to, the specimens will be soon entirely ruined. No alarm need be felt at the presence of the moisture, except that an excessive amount is an indication of early fermentation. This may be arrested, if on a several days' trip from home, by taking out the sheets with specimens, as soon as they begin heating, and exposing them a few minutes to the open air and sun.

In putting plants in the specimen sheets, whether in portfolio or press, it is well to take some pains to spread out the leaves, flowers, etc., of the specimen ; for a little care now shown may save considerable labor further on. However, with most species any carelessness in this respect can be remedied at first time changing ; yet there are some plants referred to in second paper of these notes, as, *Caulophyllum*, the *Thalictrums*, many of the *Cruciferae* and *Leguminosae*, and others, which are so delicate that whatever straightening out and arranging they receive must be done at the time they are first put in, for after that the sheets have usually to remain closed until the specimens are quite cured.

Plants which were put directly into press should receive special attention at *first change* of driers. The first change is the most important of all, so far as the arrangement of the specimen is concerned. Particular care should be taken at *this time* to straighten out and remove all folds and doublings-up in the leaves, petals, fronds, etc., and to arrange the specimens as naturally as possible, —showing both sides of the flowers and leaves. Small pieces of bibulous paper may be placed at this time between leaves and other parts of the plant which overlap each other, to prevent their moulding or discoloring, and to hasten drying. Formerly I believed it necessary to change these fragments for dry ones with every change of driers, but, if the latter are changed frequently, I find they may remain, with perhaps a change the first or second day, until the plants are cured, with no detriment to the specimens. For very succulent plants, they should be changed with driers.

The first change of driers should be made within several hours ; rarely should it be deferred longer than 10 or 12 hours from the time of putting into press. If put off longer than this, the specimens of many species become too dry to make readily the alterations required. For this initiatory pressing a lighter weight—25 lbs. for instance—and fewer driers may be used, as the chief aim is merely to overcome that stubborn rigidity and elasticity, so troublesome in specimens when first put in the sheets, by rendering them sufficiently flaccid for every part to stay in the position arranged. The final arrangement of those plants collected in portfolio should be made while transferring to the home press, as they will then be found sufficiently collapsed to be managed easily. For picking at the leaves and flowers in arranging specimens, there is nothing much better than a quill tooth-pick.

After the specimens have been arranged and the driers changed, they should be returned to the press and a heavier weight placed upon them. Some writers advise pressing lightly at first and gradually increasing the pressure, but my experience is in favor of quite the opposite course. As soon as the specimens have been put in order, I find it best to place the plants at once under strong pressure—as heavy as they are to receive at any time. In the case of the Sedges and Grasses very little pressure should be used; from 10 to 25 lbs., is amply sufficient.

To have specimens retain their *naturalness* in color, form and appearance, we repeat, they should be dried as rapidly as possible, and the best way to secure this result is by *frequent changing* of the driers. The driers should be changed at least once a day for the first four or five days, and afterwards every other day until the specimens are cured,—which in most plants will be in about a week. While *good* specimens can be made by this treatment, I would recommend changing oftener for the first day or two, as thereby a marked improvement will be gained. The first day with Grasses, Sedges and their allies, and the first two days with most other plants, are of more importance in drying than all the subsequent time. As an acute botanist pertinently remarks: "Two or even three changes of the driers during the first 24 hours will accomplish more than a dozen changes after the lapse of several days. The most perfect preservation of the beautiful colors of some Orchids which I have ever seen was effected by heating the driers and changing them every two hours during the first day."

The using of heated driers I have found a very efficient aid in my plant drying. I employ them whenever possible in my work, and, as a factor in making fine specimens, changing with *heated driers* should be placed next in value to *frequent* changing. This heating is very simple. Spread the damp driers out in the sunshine, and when dry bring them in hot and make changes at once. It is surprising to see what a marked effect these heated driers have upon fresh or stubborn specimens, and how quickly they cause them to yield to their potent influence. Of course driers heated by the fire or by flat-irons answer equally the same purpose.

The period required to dry specimens varies with different species and with the season; it will depend also on the frequency of the changes and the temperature of the driers. The time is usually from four days to a week, while a few plants require even longer. But with two changes a day for the first day or two and heated driers the specimens may be dried in fully half their usual time, and in better condition. Consequently, it will be seen that the special attention recommended during their early period in drying does not, in the aggregate, make any additional labor, but rather less, for by it the plants are much sooner dried.

One of the most difficult of American plants that have come under my experience, outside of the "*Live-for-ever*" family and their neighbors, is *Liparis lilifolia.* This plant has frequently kept me *squeezing* away at it for several weeks (when not using heated driers) but I have generally succeeded in making it retain its natural color at last. With warm driers the colors may be retained of nearly all the Orchidaceous and Liliaceous groups, the Baptisias, the Gerardias (I fail with *G. flava*) and many other plants which become discolored in drying.

If the leaves of thick, fleshy plants are immersed for a few moments in hot water, it will hasten their period of desiccation, although they often turn dark in pressing as a consequence of the immersion. Many of the endogenous plants and others, if desirable, may be ironed in their driers with gratifying success. Some botanists recommend putting fleshy endogens and other succulent plants in a separate press near the stove, where they claim plants may be dried in a few days. For these plants the writer prefers using heated driers.

Small plants may be handsomely dried in old books. If only a few specimens are placed in the book, they may be dried without once shifting. Not a heavy pressure should be used. On removal of plants, dry the book for again using, by spreading open in the sunshine, or hanging on a line near the fire.

It may sometimes be convenient to dry certain plants by placing them in a suitable vessel and covering (sifting) with warm dry sand. In a day or two they will be found nearly free from moisture, when, if expedient, they may be transferred to the press.

Viscous plants and those likely to adhere to the sheets enclosing them may have Lycopodium, powdered soapstone, or some similar substance sprinkled over them to prevent their sticking. In the absence of any of these powders I have used fine white sand with fair success.

In changing the driers of the plants, place the package to be changed at left hand on the table or counter, the new pile in front of the sitter, with its length parallel, a position the most favorable for giving any needed attention in arranging specimens, while the fresh driers may be placed at right hand, or beyond the pile in front. Thus arranged, the sheets of specimens can be rapidly shifted into their fresh driers.

The driers and packets may be dried in several ways. The packets may be hung on a line in a warm room, or in the open air when not too windy ; the driers, after the dew has disappeared, may be spread on the grass. A better way, for the latter, if you have the room, is first to lay down in a sunny place a covering of old boards, sticks, brush, or anything to keep them from the ground. A favorite place with the writer, on a still day, is on the top of a flattish tin-roof, where, exposed to a fierce radiating heat on one side and the direct rays of the sun on the other, the driers and packets dry perfectly in a few minutes.

Always spread your moist driers in the sunshine when possible, and then at longest they will dry within an hour, unless put out too late in the day. Do not leave them too late in the day, as the dew falls early in the shade. Take them up while hot, even if not to be immediately used, as much heat will still be found in a pile of driers at evening changes.

During cloudy weather, it may be necessary to dry both packets and driers in the house. If no better way present itself, the latter will have to be spread about the room. Some botanists make a hole in each end of drier or packet and string them on a stout wire or rod, suspended on hooks set in the wall or a shelf. The writer has arranged a kind of rack for the driers, which he places near the fire.

I shall close this paper with a recapitulation of a few of the more important hints on good drying.

Select the most bibulous paper for driers.

Use specimen sheets to enclose plants in drying.

Do not make the piles too large.

The first change of driers should be made within several hours after putting into press;

Then remove all folds and arrange specimen naturally.

Change driers twice a day for a day or two.

Use heated driers when possible.

§ 271. **Two remarkable forms of Trillium.**—Mr. Darius R. Shoop has sent us from St. Louis, Michigan, two remarkable forms, as I take them to be, of *Trillium grandiflorum*. Both show certain marks of abnormality in the stripe of green down the centre of the petals, although in one of them it is slight. One of these specimens is a slender *T. grandiflorum* with leaves petioled in the manner of *T. nivale*. Mr. Shoop took it for a large form of the latter species, and the leaves are quite as much petioled; but they have the cuneate base and the conspicuously acuminate apex of *T. grandiflorum*; and the flower is just like that of this species with partly chlorosed petals, such as are occasionally met with.

The other specimen, which Mr. Shoop would like to have named *T. aphyllum*, is most remarkable. The stem, as we take it to be, though the base is not given, is six inches long, and bears a fine large flower and nothing else. The sepals are rather more foliaceous than is usual, and are fully two inches long, quite equalling the petals. There is no doubt of its being a sport. But both these freaks should be watched, and all the forms found growing with them likewise gathered. A. GRAY.

§ 272. **North-eastern Plants.**—Mr. C. G. Pringle, Charlotte, Vermont, sends his list of "Alpine and rarer Northern Plants" with several additions, and the following note. These plants he offers for exchange for good herbarium specimens, or selected specimens for sale, labelled, and carriage prepaid, at 10 cents a specimen. The testimony to the excellence of his specimens we have heretofore given:

At the close of another season I am able to report a few finds which may be of more or less interest.

Sisymbrium canescens, Nutt. Cliffs, shore of Lake Champlain, near Westport, N. Y.

Halenia deflexa, Griseb. In low woods on a river bank, Charlotte, Vt.

Comandra livida, Richardson. Under stunted firs on the summit of Mt. Mansfield, Vt.

Callitriche autumnalis, L. In a shallow bay of Lake Champlain, Alburgh, Vt.

Blysmus rufus, Link. Shore of the St. Lawrence, Temisconata, Canada.

Carex arcta, Boot. Low woods near outlet of Lake Champlain.

Equisetum palustre, L. Sandy shore of Lake Champlain, Shelburne, Vt.

Equisetum littorale, Kühlewein. In several places on the gravelly shores of Lake Champlain.

Specimens of these two Equista have been examined with the greatest care by Prof. Eaton, and those of the latter species corresponded with the utmost nicety with Milde's figures and with specimens from Milde's own hand. These two plants appear much alike, especially when dry, and are likely to be confounded unless sections of the stem are made. I may add by the way that Prof. Eaton assures me that the E. littorale distributed by Mrs. Roy from Lake Huron is E. palustre, L.

The statement copied into the October No. of the BULLETIN, that in no other State but New York is Woodsia hyperborea, R. Br., known to exist, needs correction. This species grows in two places in Vermont, about Mt. Mansfield and on Willoughby Mountain.

C. G. PRINGLE.

CHARLOTTE, VT., NOV., 1878.

§ 273. **Catalogue of North American Ferns.**—I have in preparation and nearly ready for the printer, a Catalogue of the N. A. Ferns (North of Mexico) in the "Davenport Herb." Mass. Hor. Soc., with notes giving localities, time of collection, names of collectors and donors, accompanied by occasional critical remarks, which I shall publish, provided I can obtain a sufficient number of subscribers to meet the expense of doing so. It will probably make a neat Catalogue of about 20 pages, and be a complete and accurate list of all the ferns now known to grow within our limits. The price will depend on the number of subscribers—probably in no case exceeding 50 cents a copy. Address GEO. E. DAVENPORT, 8, Hamilton Place, Boston, Mass.

§ 274. **Introduced Plants.**—In addition to the species reported in the September number of the BULLETIN we add the following:

64. FLAVERIA CONTRAYERBA, Juss. A Chilian plant, first found by Mr. Ruger on a wharf at Hunter's Point, in August. It was quite plentiful in a single patch throughout Sept.
65. *Dactyloctenium Aegyptiacum*, Willd. Wharf at Jersey City; one large clump containing above 100 flowering specimens.—Sept.—Oct.—So. States.
66. *Cynodon Dactylon*, Pers. With the last.—Sept.—Oct.
67. LEPTOCHLOA FILIFORMIS, Kunth. With the last.—Sept.—Oct.
68. *Crypsis schœnoides*, Lam. With Flaveria, at Hunter's Point, a single specimen. *Cynodon Dactylon* was also found there in considerable number.—Mr. Ruger.

ADDISON BROWN.

§ 275. **Nature on the rampage.**—We have received a charming letter from a valued correspondent of the BULLETIN, who has removed to South-western Michigan. We trust she will pardon the publication of the following extract: "The spring flowers here are abundant and beautiful, but, though everything grows enormously, there is no such place for surprises as at the East. We found Epigaea last spring, greatly to our content, and a thicket of wild crab, which, like Thoreau, we much delighted in. As we have a boat on the river, we study the water plants somewhat, but everything becomes a jungle soon. I have seen acres of tall annuals and ferns woven into a compact mass with Cuscuta chlorocarpa, which had finally given them, at a distance, an orange bloom from its own color. * * * * Think of Erechthites hieracifolia twenty feet high, and Phleum pratense seven feet and two inches in height when it grew wild, as I have seen them both. The birds are plentiful and very tame—too tame, I sometimes think. The mocking thrush will come to a tree where I am, sit within five feet of me, and sing as if it were mad with joy. Carolina doves roll and sun themselves almost at my feet, and I really don't know sometimes but the little scolds will combine and drive me out of my strawberry-bed altogether, they are so fearless, and angry if I disturb them. Hares run about everywhere. I have seen seven or eight at once playing in my pear orchard. They keep a bed of Verbenas eaten down and take the most of my pansies."

§ 276. **Publications.**—1. *American Naturalist.* In the August No., Prof. W. J. Beal explains the fertilization of Utricularia and Pyxidanthera., and in the October No., "How Thistles spin." Dr. Edward Palmer in Sept. and Oct. Nos. has a very valuable paper on the Plants used by the Indians of the United States. In the November No. Mr. Davenport distinguishes between *Aspidium spinulosum* and variety *intermedium*, which he is inclined to regard as a distinct species and to name *A. Americanum.* The most decided differences are that in *A. spinulosum* the under surface is smooth, indusium naked, sori terminal on the veins; in var. *intermedium*, the under surface is finely glandular, indusium covered with stalked glands, sori medial or subterminal on veins. It is necessary to collect specimens early, as the glands are fugacious, quickly disappearing after the indusium begins to contract. He is likewise inclined to consider Var. *Boottii* also as distinct, at all events as more nearly allied to *A. cristatum.* In the same No. Mr. Ward discusses the Natural succession of the Dicotyledons. Two recent works of great interest bearing on this point, are:—2. *Blüthendiagramme*, by Dr. A. W. Eichler, 2nd Part, Leipzig, Engelmann, 1878, and—3. *Vergleichende Untersuchungen über Entwicklung dikotyledoner Keime*, by Dr. F. Hegelmaier, Stuttgart, Koch, 1878.—4. *American Journal of Science and Arts.* In the August and September Nos. is published Dr. Gray's Lecture on Forest Geography and Archæology, in which his well-known views, confirmed by Arctic discoveries, as to the effects of the glacial period on plant distribution are applied to the four forest regions of the opposite shores of the Northern Atlantic and

Pacific. These are estimated to contain of trees properly so called and extra-tropical—

Atlantic American, -	non-coniferous,	55	genera,	130	species.
	conifers,	11	"	25	"
		66	"	155	"
Pacific American, -	non-coniferous,	19	"	34	species.
	conifers,	12	"	44	species.
		31	"	78	"
Japan-Manchurian, -	non-coniferous,	47	genera,	123	species.
	coniferous,	19	"	45	"
		66	"	168	
European,	non-coniferous,	26	genera,	68	species.
	coniferous,	7	"	17	"
		33	"	85	"

If we compare the respective totals of these tables, we notice a pretty close correspondence between the eastern sides of the continents in excess and between the western sides in deficiency, which would lead us to suppose that some common cause had been at work, especially when Dr. Gray points out that many of the same missing trees of the great northern forests are found fossil in Europe and Pacific America. But this correspondence is much impaired when we consider separately the non-coniferous and coniferous trees of the two western sides of the continents. Dr. Gray admits the difficulty of explaining our Pacific forest completely, but the lecture is full of instruction on its peculiarities, on the influence of rain on forest distribution, and on many other points. In reference to his remark that probably "the line of demarkation between our woods and plains is not where it was drawn by nature," Prof. C. A. White, in a note to the October No., states that: "The forest area of Iowa is rapidly increasing to-day, both by natural growth and artificial propagation." In the November No. Prof. Farlow has a note on Prof. de Bary's prosecution of observations on the asexual production of *Pteris Cretica*, first noticed by Dr. Farlow. It seems that not only other ferns, *Aspidium Filix-mas* for example, have this peculiarity, but also other plants. Of *Chara crinita* the female is alone known in Northern Europe, yet it fruits abundantly. Something similar takes place even in higher plants.—5. *The American Quarterly Microscopic Journal*, Vol. I, No. 1., Oct. 1878, Published by Hitchcock and Wall, 150, Nassau, New York, $3 per annum. We hail this new publication as a sign of increased attention to the microscope, on which the future of botany so largely depends.—6. *The Forests of Alabama and their Products*, and *The Grasses and other forage plants of Alabama*, by Chas. Mohr, Mobile. The list of trees and shrubs numbers 221. An introduction describes the geological formations where they are found, and the wonderful increase in the lumber activity of Alabama. 137 grasses are enumerated. Among the forage plants we are surprised to see Desmodium acuminatum and

D. nudiflorum esteemed as nutritious, milk producing plants, frequent in rich shady woods. 7. *Botanical Gazette.*

§ 277. **A Truffle New to the North American Flora.**—At a meeting of the Club on Nov. 12th, Mr. W. R. Gerard called attention to his recent discovery, on Staten Island, of a species of Truffle. He stated that these fungi had always been regarded as rare in America; but that their rarity was probably more apparent than real, the plants not having been looked for. Dr. Torrey, in his Catalogue of New York City Plants, published in 1819, records the edible truffle (*Tuber cibarium*) as found in "Love Lane" (21st Street?) This statement, however, is doubtful, inasmuch as Dr. Torrey, unacquainted with fungi, sent his specimens for naming to Schweinitz, and the latter, in his "Synopsis," published in 1834, states that he had never met with a truffle in this country, but recorded the *Tnber cibarium*, on heresay only. In the Rev. M. J. Berkeley's "Notices of North Ameriean Fungi," published two years since in *Grevillea*, he records but a single species—*Tuber macrosporum*—sent from Pennsylvania by Michener. Mr. Gerard was under the impression, although he was not positive, that he had seen a statement that another species had been detected in California last year. At any rate, the present would seem to be only the third (if, indeed, not the second) authentic account of the discovery of a genuine truffle in North America; and, for that reason, was a matter of considerable interest. The Staten Island species was found at Hugenot, growing in a side bank, in loamy soil, about the roots of alders (*Alnus serrulata.*) The tubers were about the size of a nutmeg, with a firm, smooth, cream-colored skin. The *asci* were nearly globular, and contained four large, broadly oval, reddish-brown sporidia, the surface of which was covered with a beautiful network of hexagonal reticulations; and from the angles of the latter arose short, linear, hyaline spines. The plant answered pretty well to the description given of Tulasne's *Tuber dryophilum*, and was perhaps that plant. In the absence of specimens M. Gerard exhibited a water-color drawing of the plant, with magnified figures of the fruit.

§ 278. **Herbarium for sale.**—Mr. James N. Bishop, Plainville, Connecticut, desires to sell at once his herbarium, consisting of about 1500 mounted specimens, and the same number unmounted, comprising many rare plants collected by himself there, and some from the South and West, and all correctly named. He will sell for almost any cash figure, though he thinks he ought to receive from four to five cents each for those that are mounted, and half that for those that are not.

§ 2[illegible]. **Erratum.**—The three lines appended to Prof. Eaton's article, p. 265, in our October number, were not intended for publication: moreover we understand that the publisher will have the plates in question reprinted correctly, and issued to the subscribers free of cost to them. Polopodium for Polypodium was a slip of our own. EDS.

***Terms.**—One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club.* 25 *cents. Address,* WM. H. LEGGETT, 54, *East* 81*st Street, New York. Money Orders on* Station K. *N. Y. All subscriptions or orders filled only on receipt of the money.*

The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College, at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club, may be found at* 245 *Broadway.*

§ 280. **Diclytra Dielytra, Dicentra.**—To verify references is always important. A little mistake was made in my Genera Illustrata, i, 120, and Manual, 61, through my inability to do so. Until now I possessed no copy of Römer's Archiv der Botanik, nor did I know of any copy in America. Relying upon Bernhardi, who in Linnaea, viii, 458, declared that Borkhausen's name *Diclytra* was a misprint, and that the name should be written *Dicentra*, I wrote in the Genera that the name in its original form was a slip or typographical error, but that the derivation was correctly given by Borkhausen. In the Manual the statement is similar. We have now Römer's Archiv, and the essential parts of Borkhausen's paper were reprinted by Pfeiffer, whose article is duly referred to by Watson in his Index. The correction I have to make is this. The error in Borkhausen's paper can hardly be typographical. Three times the name is printed *Diclytra*; and this is said to be composed of "δις, zwey, und κλυτρον, Sporn." There is, of course, no such Greek word: the word "Sporn," spur, throws out Sprengel and Reichenbach's conjecture that ἔλυτρον was meant; that the printer could have changed *Dicentra* and κέντρον into *Diclytra* and κλυτρον seems most unlikely. It is more probable that Borkhausen fancied there was such a word.

There is diversity in the orthography of Borkhausen's name. In Römer's Archiv the name appears as Borckhausen, and it is so given by Bernhardi: it is so printed on the title page of his own Botanisches Wörterbuch. But Endlicher, Pritzel, and the Royal Society's Catalogue write Borkhausen, and Pfeiffer, in Bot. Zeitung, noticing the two forms, adopts this as the more correct. A. GRAY.

§ 281. **Sporting Trillium grandiflorum.**—The note on the forms of *Trillium grandiflorum* collected by Mr. Shoop, which I contributed to the November No. of the BULLETIN, has brought to me a letter from an old correspondent, Mr. E. L. Hankenson, of Newark, Wayne Co., N. Y., along with a remarkable series of abnormal variations of the same species. They all have conspicuously petioled leaves; and this peculiarity is the only abnormal feature in some of the specimens, except the smaller size which is common to all of them. But the acute base and acuminate apex of every leaf keeps them all apart from *T. nivale.* The same clump furnishes specimens: 1, with a whorl of three petioled leaves in the ordinary position; 2, with peduncle as a naked scape, and two very long petioled leaves from the root-stock along with the scape; 3, the same with a solitary leaf of this sort. These variations are rather common in Mr. Hankenson's observation. Monstrous forms with chlorosed perianth are common. In one of these the tip of a rootstock sends up two filiform stems, side by side: one of them terminates in a whorl of three long-petioled leaves, the petioles of about the length of the blade; the other is terminated by a blossom with foliaceous (green and white) petals, imperfect stamens and a more depauperate imperfect pistil. Other leafless flower-stems bear only a depauperate green flower; the perianth of six similar green leaves; the stamens not transformed but abortive as to pollen; the pistil sometimes reduced to a mere vestige, sometimes raised on a short internode which supports three of the stamens, and undergoing partial reversion into green leaves. I find that Mr. Hankenson contributed to the first volume of the BULLETIN (Vol. i, No. 6, June, 1870) a short note upon some of these variations. A. GRAY.

§ 282. **Agaricus with the odor of Chlorine.**—The note on Truffles, on page 276 (last BULLETIN), reminds me—1st. That these fungi must be very scarce in this country, for I have been looking out for them for the past 20 years without finding them more than once or twice:—2nd. A year ago last August I found a most remarkable new Agaricus. *It was exhaling a strong odor of Chlorine when found*, and continued to do so while it was kept fresh. The appropriate specific name, *chlorinosmus*, has been given to it by Prof. Peck, to whom I sent the specimen together with a few notes of its peculiarities.

* AGARICUS *(Amanita)* CHLORINOSMUS, PECK. A very large species, somewhat firm in texture, and nearly pure white. Pileus about 6′ in diameter and 1′—1½′ thick, convex above, the margin incurved, the under surface flattish and of a very light cream color, clothed on the upper side around and towards the margin, to the depth of a half inch or so, with an extremely light and soft deciduous efflorescence or powder, with a scarcely discernible yellow tint (like lime when but slightly charged with chlorine); towards the centre this powder becomes thinner and more compact, and at length (in the centre) it passes into soft, now friable and then persistent, warts or corrugations. Volva friable and caducous (or none?). Stipe solid, subcompressed (always ?), 6′ or 7′ high and about 1½′ thick, and extending about 4 inches beneath the ground.

It was found nearly a half mile from any building or public road, growing among coarse gravel and cobble stones, near the base of a steep (gravelly) wooded ridge with a north-westerly slope, and which was burned over during the preceding spring or autumn.

That the plant was exhaling chlorine there can be no doubt; since there is no other substance known having the same, or even a remotely similar odor. There was no mistaking this odor, which was by no means faint. Several persons besides myself, who were familiar with the smell of chlorine, and who handled the plant when fresh, immediately and positively recognized it. Among these persons are J. H. West, Teacher. (now of Lodi, N. J.), I. A. Zabriskie, Druggist, and Fred. Ahrens, Hotel Keeper. Undoubtedly the chlorine was taken from the soil by the plant in the form of a chloride, most probably the chloride of ammonium, or possibly of sodium.

For the following, and other reasons, I cannot help looking upon this as a most important scientific discovery. Here we have chlorine, hitherto considered a potent destroyer of all organic substances, actually exhaled by a living organism!—another striking proof that organic matter, when under the influence of, and protected by, the principle of life, is not amenable to the ordinary laws of chemistry, and may successfully resist or even create a destroying power, to which all organic substances brought within its influence *and not thus protected* readily succumb.

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* Desc. by Peck. [illegible] [illegible], 137.

In this connection I may remark that Agaricus edulis has the odor of Stachys hyssopifolia, Mchx. C. F. Austin, Closter, N. J.

[The Californian Eschscholtzia, it is well known, has "a colorless juice but with the odor of muriatic acid." We have the best authority for saying that this juice on being tested gave no trace of chlorine. Perhaps the same result will appear in the case of this new Agaricus.—Eds.]

§ 283. **Publications.**—1. *New York State Museum: Reports of the Botanist, Charles H. Peck, to the Regents of the University.*—Two of Mr. Peck's valuable and interesting annual botanical reports—the 29th and 30th—have recently made their appearance. The tardy manner in which the State issues these important contributions is greatly to be deprecated, inasmuch as it must not only prove a serious annoyance to those naturalists who originally describe therein species new to science, but also to others working in the same field, and who are desirous of obtaining access to such descriptions as early as possible. Upon consulting the 29th Report, which contains an account of the work done in the year 1875, we find that during this season there were added to the State Herbarium 201 species of plants not before represented therein; and that there were collected and received 153 species, all *fungi* and new to the Herbarium. Of this number, 80 are regarded as new to science. It appears that up to the date at which this report was submitted to the Regents (Jan. 1, 1876) nearly 300 species of *fungi* that attack and inhabit various living flowering-plants had been detected within the limits of the State. Many of these are parasitic on food-plants, and hence prove a serious injury to the Agricultural industry of the country. On the other hand, some of these fungi attack noxious weeds, and hinder their dissemination and multiplication, and for this reason must be regarded as the friends and allies of the farmer. Mr. Peck, believing that it is desirable that the life histories of these fungus friends and foes should be better known than they are, and that the means of multiplying or diminishing their numbers should be under control of the farmer, submits, as an appendix, a list of the parasites with the names of their host-plants. As those who have in charge the distribution of these reports, however, keep them out of the hands of the farmer, it is not very plain what good the publication of such a list is to do *him*.

An examination of the 30th Report reveals the fact that during the year 1876, there were added to the Herbarium 130 species of plants not before represented therein. During the same period there were collected in the State 168 species new to the Herbarium, 129 of which were fungi. Of the latter 69 are regarded as new or previously undescribed. In the preface to his Report Mr. Peck gives a sad description of the extensive ravages of a beetle (*Hylurgus rufipennis*) among the Spruces of the Adirondacks. The report closes with a list of parasitic fungi and their host plants, as a supplement to the one mentioned above, and presumably for the use of the farmer!—2. *Proceedings of the Academy of Natural Sciences,* *Philadelphia*, April—September, 1878. Of botanical interest we note Thomas Meehan on "The law governing Sex." It is no new thing hereabout that *Acer rubrum* is in effect dioecious. but the observation of the checked growth of the fairly starting stamens or pistils is very interesting as showing a development caught in the act, and is similar to what occurs in *Silene inflata* as we pointed out years ago. Dr. J. Gibbons Hunt and Mr. Edward Potts throw some new light on the action of the glands in the Asclepiads. Dr. Hunt's observations were made on *Stapelia asterias*, the disagreeable odor of which, it seems, is, by its attraction for flies, a means to cross-fertilization. "Continuous observation for several hours, under a lens which took in a large field of view, revealed many flies eagerly applying their tongues all over the petals and essential organs, apparently eating with almost intoxicated relish the attractive excretion covering those parts. This banquet was indulged in in safety until their tongues came in contract with one or more of five black spots situated near and alternate with the stamens, when, with amazing quickness, the fly was seized and firmly held by the, tongue, a helpless prisoner. Now a struggle commenced, and if the fly was small and not vigorous, he remained in the trap, but, if large and strong, his efforts to escape were successful, and he flew away dragging from its position the black sensitive spot and also the pollen masses, two of which are attached to each trap. This adhesion of the fly's tongue to these black spots is not caused by any cementing liquid, but it is fairly caught by an organic structure, the action resembling that of a common steel trap used for catching rats." "The organ at the juncture of the pollen masses is the sensitive trap, and when touched, however lightly, by the fly or other object (as a hair for example), the *opposing, separated, parallel, and hard edges instantaneously close like pincers*, and the prey is secured." The words we have italicized contain the novelty in Dr. Hunt's observation, and seem to indicate a sensibility in the so-called gland, the action of which gland in our common Asclepiads has often puzzled us. Dr. Hunt's attention was called to the subject by Mr. Isaac Burk, and at the suggestion of the Doctor, Mr. Potts examined such species of the genus Asclepias as were within his reach. His statement is that when a fine hair touched "the sensitive inner surface of a gland" it caused "it instantly to contract." He notices that "the glands remain open and susceptible long after plucking the flowers." The figure he gives is not so decisive as that of the Stapelia, and allows of mechanical action as a possible explanation.

§ 284. **Parry's Herbarium.**—"Dr. C. C. Parry, of Davenport, Ia., has deposited in the Academy of Science, at that city, his large botanical collection of thirty thousand specimens, the labor of thirty-six years."

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory 40 cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V. with index, and photograph of Dr. Torrey, $3.75. Copies of Constitution and By-Laws of the Club. 25 cents. Address*, WM. H. LEGGETT, 54, *East 81st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money.*

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BULLETIN OF THE TORREY BOTANICAL CLUB.
Vol. VI, No. 49.] [New York, Jan. & Feb., 1879.

§ 285. FRESH WATER ALGAE.

Synopsis of Discoveries and Researches in 1878.

The subjoined list is prepared on the plan of those I have heretofore presented. The species are arranged in accordance with the nomenclature of Dr. Rabenhorst, whose system I follow, not that it is wholly above criticism—no system is—but because it takes in the entire field, not merely sections, and is therefore more complete and comprehensive than any other.

Some of the plants described may prove to be only varieties, not distinct species, and some merely different forms or stages of plant-development, such as my own recent observations have satisfied me are of frequent occurrence; but these we will not discuss in the present paper, which is simply designed to record the plants found to correspond with species and varieties already described by European authors, and a few which, I believe, are quite new. The additions would have been comparatively few but for the invaluable aid of volunteers.

In early spring, Capt. J. Donnell Smith of Baltimore, Md., and Mr. C. F. Austin, of Closter, N. J., made a tour through Florida for the purpose of collecting cryptogams. Nearly two months were spent in this expedition and with very satisfactory results. On his way back, Capt. Smith stayed some time in South Carolina and in the Eastern part of Virginia, and, during the months of July and August, he extended his investigations into Western Maryland and West Virginia. Mr. H. W. Ravenel, of South Carolina, also went to Florida, and made collections, principally in the vicinity of Gainesville; later he explored the neighborhood of Darien, Ga. To Dr. Beardslee of Ohio, and to Dr. Hobbe of Iowa, I am also indebted for interesting specimens from the vicinity of their homes. Adding all of these gatherings to my own, I had nearly two thousand parcels to examine. As might have been expected, many were duplicates, and many similar to those heretofore noticed, but about 125 were new discoveries for the United States. These are noted in the following list.

The literature of Fresh Water Algae received some valuable additions during the year which it is proper to mention here. Dr. V. B. Wittrock and Mr. Otto Nordstedt, of Sweden, have issued a number of valuable memoirs; among these there is one by the former on "The Spore formation of the Mesocarpeae, and especially of the new genus Gonatonema"; and another on the development of systematic arrangement of *Pithophoraceae*, a new order of algae, which deserves a special notice. Dr. Wittrock found among some tropical algae a class which, in its general features, resembles the common Cladophora, but is distinguished from it by having many cells somewhat swollen, short, and rich in chlorophyll; these are most frequently alternated, in a regular manner, with the longer cylindrical cells. His attention was also drawn to this order of plants in the Lily house of the Botanical gardens at Kew, England, where the specimens he saw were supposed to have been introduced with tropical phaenogamous plants. All of the forms hitherto found were from the East and West Indies, S. America and Australia. During the past year I identified two forms of this genus. The one from Florida, and the other from a pond in this immediate vicinity. The former agrees well with P. Cleveana, Wittr., a West India plant, the other is near P. Oedogonia, Mont. a French Guiana plant. I catalogue it as P. Oedogonia, var. borealis. The first specimens I found were sterile, without the swollen or barrel shaped cells. I recognized in it a new plant and called it "Cladophora Vaucherioides."

Mr. Otto Nordstedt has also published several interesting memoirs. The latest are "De Algis aquae dulcis et de Characeis in insulis Sandvicensibus" and his "Botaniska Notiser," Nov. 1878. In the latter he has a list of the American Oedogonia hitherto recognized by Dr. Wittrock.

A valuable contribution by Dr. O. Kirchner has recently appeared, entitled "The Algae of Silesia." It is taken from a larger work, now in the course of publication, called the Cryptogamic Flora of Silesia." The part published contains not only a descriptive list of the Algae of Silesia, but valuable information on the structure of plants, and a brief notice of researches made by others into the life history of Fresh Water Algae. It is a work that should be in the hands of all who pursue this study. FRANCIS WOLLE.

PHYCOCHROMOPHYCEAE.

Microcystis, Ktz.—*M. Donnellii*, n. sp. Thallo sordide luteolo-olivascente; familiis globosis vel ovalibus, saepe plus minus angulosis, solidis, viridibus, sphaericis; cytioplasmate granuloso viridi. Diametro cellulis .00009″—.00016″; famil. 0015″—0035.″ Hab. in stagnis libere natans.

The forms recognized under Microcysts are not unfrequently earlier stages in the growth of some filamentous algae and this may be of that character. It was found in soft gelatinous masses, often nine and ten inches in diameter, floating in ponds; being unlike any described forms, I record it as above, hoping a further opportunity may be presented to study it more thoroughly. Collected in Garrett Co., Md., July, 1878, by J. Donnell Smith.

Hypheothrix, Ktz.—H. aeruginosa, Ktz. Forms a deep green stratum on wood at the artesian well, Charleston, S. C. Coll. J. D. Smith.—H. tinctoria, Rabenh. Parasitic on water plants.

H. tenax, n. sp.—H. strato late expanso, plus minus pulvinato, compacto, sordide olivaceo-viridi; trichomatibus initio laxe flexuoso-curvatis, deinde in membranam firmam vel pulvinatam dense intricatis, pallide aerugineis; articulis subaequalibus, saepius indistinctis, nonnumquam interruptis; vaginis arctis, achrois, subfirmis. Diametro cum vaginis .00014″—0002.″ Hab. in stagnis lapides fissiles occupans.

Oscillaria, Bosc.—O. princeps, Vauch.—O. percursa, Ktz.—O. rufa Ktz.—O. chalybea, Mertens. All from moist ground, Florida. Coll. J. D. Smith.

Phormidium, Ktz.—P. Retzii, Ktz.—P. Naveanum, Grun.—P. subtorulosum, Breb.—P. fonticola, Ktz.—P. Julianum, Rabenh. All from Florida. Coll. J. D. Smith.—P. fasciculatum, Naeg.—P. Joannianum, Ktz. Both from Suffern, N. Y. The first growing on Aulocomnium in a swamp; the other from old wood. Coll. C. F. Austin.—P. rupestre, Ag. Forms a matted stratum on rocks; Garrett Co., Md., Coll. J. D. Smith.

Lyngbya, Ag.—L. aeruginosa, Ag. In pools of moist earth subject to inundations from flowing tides, N. Jersey.—L. major, Ktz. St. Lucia river, Florida. Coll. J. D. Smith.

Hydrocoleum, Ktz.—H. heterotrichum, Ktz.—H. Helveticum, Naeg. In gelatinous strata on stones in marshy places.

Symploca, Ktz.—S. fuscescens, Ktz.—S. terrestris, Ktz. Wet ground and river banks.

Nostoc, Vauch.—N. muscorum, Ag. On *Grimmia.* Coll. T. S. Brandegee, Colorado· A dubious species and genus.

Nostochopsis, Wood. Have plants from Florida that agree well with diagnosis. They are probably an undeveloped form of *Hapalosiphon.* Coll. J. D. Smith.

Capsosira, Ktz.—C. Brebissonii, Ktz. Intermingled with *Phormidium.* Florida. Coll. J. D. Smith.

Mastigonema, Swabe.—*M. Donnellii*, n. sp.—M. caespitosum in strato mucoso, olivaceo-viridi; filamentis saepius simplicibus, flagelliformibus, longissime productis, variis, modo tenuibus et flaccidis, modo validis et rigidis, diametro .00024″—.0005″, ad basim saepe .0006″—0008″, nonnumquam pseudo-ramosis, leniter curvatis, dense intricatis; internis pallide vel pulchre aerugineis, vel fuscescentibus, saepe interruptis; distinctissime sed breviter articulatis; articulis diametro plerumque 4-5-plo brevioribus; arctissime vaginatis; vaginis achrois subtilissimis, in apice saepe filiforme productis; adultis truncatis et apertis. Cellulis perdurantibus, globosis, compressis, basalibus et rarius interstitialibus. Hab. in lignis aqua maritima submersis.

This is a beautiful plant, but variable, and might under some of its transformations be classified with the *Leibleinia*, Endl, or *Desmarestella*, Bory, but the basal heterocysts of the perfect plants, the formation of spores in the swollen basal parts of the trichomas and the development of the plants from subspherical spores, all of which I found fully exemplified, connect it with the Mastigonemas. Filaments are sometimes thin and flaccid, but the bases are much swollen. Intermingled are others of twice the size. The articulations are composed of thin disks; these frequently separate into short sections, the disks of the ends of which incline towards each other, and thus form a sort of dark double concave division in the trichomas, such as are not unfrequently seen in the filaments of Lyngbya, Tolypothrix, etc.

M. velutinum, n. sp.—M. strato plus minus expanso ad duas lineas crasso, pulvinato, humectato molli-tomentoso, velutino, saturate olivaceo-viridi; trichomatibus subrectis vel

(turn the 2 leaves)

flexuoso-curvatis, simplicibus, laete aerugineis, nonnumquam luteo-fuscescentibus, distincte articulatis; articulis diametro 3–4vel 6–8plo brevioribus; vaginis arctis, initio cuspidatis clausis, adultis truncatis et apertis. Cellulis perdurantibus, subglobosis, pallido-luteolis, trichomatis diametro minoribus. Diam. trich. cum vaginis saepius .0005″, rarius .0003″—.0006″. Hab. in lignis madidis aquae maritimae.

A distinct and fine plant. I found it in an extended olive green stratum, a little above the water level, on the plank sides of a neglected basin of sea water, at Perth Amboy, N. J., July, 1878.

Schizosiphon, Ktz.—Sch. Cataractae, Naeg. Niagara Falls.—Sch. Meneghinianus, Ktz. In a gelatinous stratum on old, wet wood, Florida.—Sch. Bauerianum, Grun. Submerged wood, Florida; both collected by J. D. Smith.—Sch. crustiformis, Naeg. Wet rocks, Cannon City, Colorado. Coll. T. S. Brandegee.

Scytonema, Ag.—Sc. ambiguum, Palisades, N. J., C. F. Austin; and Gainesville, Florida, H. W. Ravenel. Frequent on moist rocks and on the ground.—Sc. truncicola, Rabenh. Old pine board, Aiken, S. C. Coll. H. W. Ravenel.—Sc. Hegetschweileri, Itz. Cannon City, Colorado. Coll. T. S. Brandegee.—Sc. turfosum, Ktz.—Sc. polymorphum, Ktz.—Sc. Notarisii, Menegh. These three from moist earth, Florida. Coll. J. D. Smith.—Sc. intertextum, Ktz. Old wood, Florida, J. D. Smith.

Sc. mirabile, n. sp.—Sc. strato plus minus expanso, olivaceo-fuscescente, vel viridescente; trichomatibus validis, flexuoso-curvatis, distincte articulatis; pseudo-ramulis numerosis, plerumque geminis et coalitis ad terminalia; articulis diametro duplo triplove brevioribus, saepe submoniliformibus, aerugineis. Vaginis trichomatum firmis, laevibus, olivaceo-luteis, vel rarius subachrois. Cellulis perdurantibus interjectis, singulis, subglobosis, luteis. Diam. trich. cum. vag., .0008″—.001″; ramulor. .0005″—.0006″. Hab. in Taxodii cortice. Florida. Coll. H. W. Ravenel.

The development of this plant was described under "A Nostoc the matrix of Scytonema" in the BULLETIN of April last.

Sc. cortex, Wood, var *corrugatum*, n. var. In the collections made by Mr. Ravenel in S. Carolina and Florida, and by Messrs. Smith and Austin in Florida, I found no less than thirty different specimens of a plant in almost as many forms and phases of growth. The number enabled me to make the plant a thorough study. Its development from cysts was well exemplified. Two forms are described by Dr. Wood; one as Sc. cortex and the other as Sc. Ravenelii. They are evidently the same plant; another, very distinct, and beautiful form, I call var. *corrugatum*, and another might be called var. "bruneum." The filaments of the former often measure .0007″ to .00116″. They are of a bright aeruginous color and are coated with a colorless gelatin; this in drying contracts irregularly, thereby

(omit 2 leaves)

causing the filaments to appear crenate or corrugate. The other variety "bruneum" is dark brown. The filaments are covered with what appear to be subspherical resinous cells. This is probably an older form of the *corrugatum* variety. The term "cortex" is significant and should be retained; then *Ravenelii*, *corrugatum*, and possibly *bruneum* would be varieties. The other forms of this genus have their parts in accord with accepted descriptions, but I am by no means satisfied that all are distinct species. I accept the dicta of the fathers until a fuller light dawns.

Calothrix, Ag.—C. mirabilis. Ag. Falls of Deep Creek, Md. Coll. J. D. Smith.

Tolypothrix, Ktz.—*T. Ravenelii*, n. sp. T. in strato minus expanso, aureo-fusca, trichomatibus pseudoramulisque elongatis; internis flavo-rubescentibus saepe interruptis, distincte articulatis, articulis gracillime granulosis, diametro subaequalibus vel duplo brevioribus; vaginis subarctis, luteo-fuscescentibus; cellulis perdurantibus basilaribus et interjectis, plerumque singulis, oblongis, luteolis. Diam. cum vaginis .0006″—0008″, rarius .001″. Hab. in rupibus aquae dulci expositis.

This plant was found on sand stone rock, Gainesville, Fla., by Mr. Ravenel. It is nearest to T. distorta, but differs in size, in articulation, in the character of the heterocysts, and in habitat.

Hapalosiphon, Naeg.—H. Braunii, Naeg. Not infrequent in fresh and salt water, in limited quantity, from Pennsylvania to Florida.—H. fuscescens, Ktz. Dr. Rabenhorst remarks on this species, "ab antecedente vix diversus."

The plant I place here is more distinct; the articulations of the rhizoma are usually subequal and moniliform, and those of the branches one to two diameters in length. Frequent in pond at Pleasant Mills, N. J. Young forms of this genus may be readily reconciled with the characters of the genera *Mastigocladus*, Cohn, and *Nostochopsis*, Wood.

Sirosiphon, Ktz.—S. ocellatus, Ktz. not infrequent in wet and swampy places.

Much might be said of the propagation of plants of this genus. Space would not admit of it here.

CHLOROPHYLLOPHYCEAE.

Scenedesmus, Meyen.—S. antennatus, Breb. Coll. J. D. Smith, Florida.

Characium, A. Braun.—C. strictum, A. Br. Parasitic on filamentous plants.

DESMIDIACEAE.

Tetmemoras, Ralfe.—T. granulatus, Breb.—T. Brebissonii, Menegh. Florida, J. D. Smith.

Sphaerozosma, Corda.—S. serratum, Bailey. Frequent in S. Carolina and Florida. Coll. H. W. Ravenel and J. D. Smith.—S. filiformis, Ehrb. Coll. H. W. Ravenel, Georgia.

Bambusina, Ktz.—B. Brebissonii, Ktz. Not a rare plant, but new in the various conditions of development. Pond, N. Jersey.

Cosmarium, Corda.—C. commisurale, Breb.—C. Brebissonii, Menegh.—C. Cucurbita, Breb.—C. amoenum, Breb. All from Florida. Coll. J. D. Smith.

Euastrum, Ehrb.—E. spinosum, Ralfs.—E. humerosum, Ralfs.—E. pinnatum, Ralfs.–-E. crassum, Breb.—E. insigne,Hassall.—E. Ralfsii, Rabenh.—E. abruptum, var. evolutum, Nordstedt. All from ponds, Darien, Ga. Coll. H. W. Ravenel.

Micrasterias, Ag.—M. rotata, Ralfs.—M. fimbriata, Ralfs.—M. ringens, Bailey. Florida, J. D. Smith. M. radiosa, Ralfs.—M. crenata, Breb.—M. arctuata, Bailey. Ponds, N. Jersey.

Staurastrum, Meyen.—St. tumidum, Breb.—St. Cerberus, Bailey. Coll. J. D. Smith, Florida.

Xanthidium, Ehrb.—X. cristatum, Breb. Florida.—X. armatum, Breb. N. Jersey.

ZYGNEMACEAE.

Spirogyra, Link.—Sp. fluviatilis, Hilse.—Sp. subsalsa, Ktz. both from Florida. Coll. J. D. Smith.—Sp. irregularis, Naeg. Coll. Dr. Beardslee, Ohio.—Sp. decimina, Muller.—Sp. protecta, Wood.—Sp. insignis, Hassall.—Sp. gracilis, Hassall.—Sp. stagnalis, Hilse.—Sp. intermedia, Rabenh.

Zygnema, Ktz.—Z. subtile, Ktz. Darien, Ga. Coll. H. W. Ravenel, —Z. tenue, Ktz. Pleasant Mills, N. Jersey.

Zygogonium, Ktz.—Z. conspicuum, Ktz. Mountain springs, Pennsylvania and Maryland.—Z. Agardhii, Rabenh. Frequent in Florida. Coll. J. D. Smith.

Mougeotia, de By.—M. laevis, Archer. Coll. J. D. Smith, Florida.

Sirogonium, Ktz.—S. strictum, Ktz. Coll. J. D. Smith, Florida.

Mesocarpus, Hassall.—M. parvulus, Hass.—M. intricatus, Hass.—M. robustus, de By.—M. radicans, Ktz.

Pleurocarpus, A. Br.—*P. Columbianus*, n. sp. P. libere natans, caespitibus dense intricatis, sordide viridis; cellulis diametro .0016″ (0015″—.0017″) 5–8 plo longioribus.

Hab. in stagnis, Bethlehem, Pa. This plant differs from the described forms in the thicker filaments and the longer articulations.

Staurospermum, Ktz.—S. capucinum, Ktz. Pleasant Mills, N. Jersey. A beautiful plant. The quadrangular spores and the filaments are considerably thicker than the measures indicated by Rabenhorst. They are more like the Swedish plant described by Wittrock under the same name.

Vaucheria, DC.—V. sessilis, DC.—V. vesiculosa, Ktz. At places flooded by marine waters. N. Jersey. A very distinct species. Dr. Rabenhorst questions the right of its place in this genus. The large, spherical, vesicular spores, are usually terminal on the branchlets, but occasionally also interstitial. Antheridia are not found. The general appearance and growth are Vaucheria like. For the present I retain the place chosen for the plant by Kützing.

Rhizoclonium, --Ktz. Rh. fontinale, Ktz., Mountain streamlets.—Rh. tortuosum, Ktz. Prince Edward Co., Va.—Rh. fluitans, Ktz. Garrett Co., Md. Latter two collected by J. D. Smith.—Rh. salinum, Schleich. Marine inlets, N. Jersey.—Rh. hieroglyphicum, var. *stagnale*, n. var. Near the typical form, but distinct in habitat. Found a large pond of stagnant water entirely covered with a thick floating stratum.

Rh. major, n. sp.—Rh. strato saturate viridi, trichomatibus dense intricatis, subrigidis, filis ramulos breves plerumque tri-quadropartitos numerose emittentibus; articulis diametro (.0013"—.02") subaequalibus, vel duplo longioribus; cytiodermate crasso. Hab. in muris ligneis fluctibus illisis.

This finely developed, large plant was found growing on the wooden piles of the docks at Perth Amboy, New Jersey, July, 1878. It is most like *Rh. pannosum*, Aresch, and may be a variety of it. It differs in size, in the character of the short branchlets and in habitat.

Cladophora, Ktz.—Cl. fracta, var. gossipina, Ktz.—Cl. crispata, var. virescens, Ktz. Both of these plants are common in ponds, etc.—Cl. crispata, var. brachyclados, Ktz. Sluggish waters, N. Jersey.—Cl. vaucherioides—see BULLETIN, page 187, November, 1877. Must be corrected to Pithophora Oedogonia, var. borealis, see explanation in the introduction.

Pithophora, Wittr.—P. Oedogonia, Mont. var. *borealis* n. var. abundant in pond, Bethlehem, Pa.—P. Cleveana, Wittr. Swampy ground, Florida. Coll. J. D. Smith, 1877 and 1878.

Oedogonium, Link.--Oed. undulatum, Breb.—Oed. Boscii, Breb.—Oed. Braunii, Ktz. The three collected at Darien, Ga., by H. W. Ravenel.—Oed. stellatum, Wittr. Florida, J. D. Smith.—Oed. Lundense, Wittr.—Oed. Borisianum, Wittr.—Oed. varians, Wittr & Lund.—Oed. paludosum, Wittr.—Oed. sexangulare, Cleve.—Oed. Upsaliense, Wittr.—Oed. platygynum, Wittr.—Oed. Hohenackerii, Wittr.—Oed. giganteum, Ktz. These from various localities in New Jersey and Pennsylvania; the last one from Iowa. Coll. Dr. Hobbe.

Hormiscia, Aresch.—H. implexa, Ktz. Submarine soil, Florida, J. D. Smith.

Ulothrix, Ktz.—U. radicans, Ktz.—U. crassiuscula, Ktz. These two from Aiken, S. C. Coll. H. W. Ravenel.—U. rivularis, Ktz.—U. parietina, Ktz. Both from Florida, J. D. Smith.—U. compacta, Ktz. Small pool, N. Jersey.

Schizogonium, Ktz.—Sch. thermale, Menegh. Small mountain stream.

Chroolepus, Ag.—Ch. abietinum, Flotow. Florida, J. D. Smith.

Stegioclonium, Ktz.—St. debile, Ktz.—St. uniforme, Ag. Both from Florida. Coll. J. D. Smith.--St. pusillum, Ktz. On stones in streamlet.

Chantransia, Fries.—*Ch. Beardslei*, n. sp.—Ch. caespitulis purpureo-roseis, filis ramisque erecto-patentibus vel subadpressis; filamentis inferioribus diametro .001"—.002" et superioribus diametro .0006"--0008", extremis obtusis; articulis diametro ad sextuplo longioribus. Hab. in saxis fluvios juxta, Painesville, Ohio.

This plant was collected by a son of Dr. Beardslee from stones in rapid waters along with *Lemanea* and *Chantransia violacea.* It may possibly be a variety of the latter; if so it is a very extraordinary development, three to six times thicker than the typical form. It is nearer *Ch. amethystea*, Ktz. but differs in size, in the absence of enlarged ends of branchlets, and in equal length of cells throughout.

Hildenbrandtia, Nardo.—H. rivularis, Liebm. Exposed stones in Susquehanna River, Harrisburgh, Pa.

§ 286. **Distribution of Southern Plants.**—We have received from A. H. Curtiss, Jacksonville, Florida, a list of the plants in his first and second fascicles. We have before called attention to the excellent testimony to the completeness and excellence of these specimens, "well chosen, copious and perfect, carefully put up, all named, with printed tickets in neat form and taste, and cheap at the price, viz.: 20 dollars for 250 species." The fascicles will be forwarded by the Curator of Harvard University Herbarium upon receipt of the price. The postage on packages or freight to New York or Boston will be paid by Mr. Curtiss. He also offers selections of Southern or Northern plants (Mann's Catalogue or Curtiss' Check List) at $10 a hundred; and likewise roots and seeds; so that a very rare opportunity is presented for obtaining Southern plants. In this connection, we would second Mr. Curtiss' recommendation of the typographical work of H. N. Patterson, Oquawka, Ill., who makes a specialty of labels, check lists, &c.

§ 287. **North American Musci.**—Mr. Eugene A. Rau, and the subscriber will issue on or before the first of May next, a "List of North American Musci." It will make an Octavo pamphlet of about 20 pages, and will be printed on good book paper. The Genera and Species, will be arranged in their natural order, with an "Index Generum" at the end. By this arrangement the list will serve the several purposes of a check and exchange list, a key to the natural order of the plants, and a guide to their classification in the herbarium. The geographical distribution of the species will be given. Orders are solicited at once, as but a limited number of copies will be printed. The money may accompany the order or may be sent on receipt of the list. Price postpaid, single copies 25 cts.; 5 copies $1.00. Address, REV. A. B. HERVEY, Troy, N. Y.

§ 288. **New Zealand Ferns.**—We learn that Mr. G. W. Belfrage, Clifton, Bosque Co., Texas, has a fine collection of New Zealand Ferns for sale.

§ 289. **Rust Botanical Club.**—A few ladies of this city have formed a club, named the "Rust Botanical Club," of which Mrs. S. M. Rust has been elected President and Mrs. Charles Barnes Vice-President. At first we shall make the study of ferns our specialty, hoping afterward to study general botany. We wish to invite correspondence on either of these subjects, and hope to be able to furnish information regarding the flora of our County especially. Mrs. Rust has made a thorough study of them, and by her example and efforts has incited us all to closer acquaintance with our beautiful woods, lakes, &c. She discovered Botrychium Lunaria and Botrychium matricariæfolium in this County, and we hope to find Asplenium ebenoides also. Mrs. Barnes discovered the Botrychium simplex, in all its varieties, in the Adirondack region near Section No. 4, also Ophioglossum vulgatum, at Oneida, N. Y.

Several members of our Club wish to purchase rare herbarium specimens of North American ferns. Correspondents may address "The Rust Botanical Club," corner Green and Hawley Streets, SYRACUSE, N. Y. A MEMBER.

§ 290. **Aletris.**—Some time since I collected, on the road from Atsion to Tuckerton, I think at Bass River, between the two bridges, a peculiar form of *Aletris aurea*, Walt. It seems to be intermediate between *A. farimosa* and *A. aurea*, L. On referring it to Prof. Watson, he marks it A. aurea (?), and asks for a study of it while in flower, and desires mature specimens. Will Botanists collecting in that vicinity please look for it?

My brother collected at Maama, (or Miama,) Dade Co., Florida, a plant which Prof. Watson identifies as **Carica Papaya,** L. It is thoroughly naturalized, so far as I can judge by the representations of several unscientific friends who have lived there.

FRANKLIN, N. J. H. H. RUSBY.

§ 291. **A Gigantic Aroid from Sumatra.**—Not long since the announcement was made to the Linnean Society, that Dr. Beccari had discovered in the Island of Sumatra a gigantic Aroid, the bulb of which measured five feet in circumference, while the much divided leaf of the plant covered an area of 45 feet in circumference! More recently a fuller account of the plant has been received from Dr. Beccari, and from this we gather the following particulars:

In external appearance and in distribution of color the new Aroid is much like the *Amorphophallus campanulatus*, the shape of the spathe being nearly the same. As to its generic character, the discoverer considers it to be nearly intermediate between the two genera *Conophallus* and *Amorphophallus*. The specimen examined possessed a spadix nearly 6 feet long, and this not including the length of the scape, which was 20 inches long and 3 inches thick (about the dimensions of the leaf-stalk). The scape was of a green color, marked with whitish orbicular spots. The largest diameter of the spathe was nearly 3 feet and its depth about 28 inches; its shape was campanulate, with deeply toothed and crumpled edges. The deeper portion of the interior was of a very pale greenish color, but the limb was of a bright blackish-purple hue. The outside of the spathe was pale green, smooth in the lower portion, but thickly corrugated and crisp above. The spadix, deprived of the spathe, measured more than 5 feet; for 8 inches of its length only it was covered with pistils underneath and with stamens above them, the sterile organs being entirely wanting. The appendix was consequently reduced to a total length of about 4.3 feet, having at the base a diameter of 8 inches, gradually tapering towards a very obtuse apex. The ovaries were purple-colored, trilocular, or sometimes bilocular, with a single anatropal ovule in each cell; free, globose-conic shaped, tapering into a long style, terminated by a globose, externally trilobed, yellowish stigma. The stamens were sessile, with globose subdidymous anthers, opening by two narrow fissures or pores at the apex. From the description of the plant as given by Dr. Beccari, it is the opinion of English botanists that it will turn out to be a species of *Brachyspatha*.

§ 292. **The Smallest Orchid Known.**—Closely following the account of the discovery of the largest Aroid, comes the news of the rediscovery of the smallest orchid known to science. Baron Von Mueller states, in a recent letter, that more than twenty years ago, he was shown a very minute creeping orchid, from the vicinity of Port Jackson, East Australia, and that the plant was highly remarkable for its extremely small disk-like leaves. It was discovered by the Rev. Robert King, of New South Wales, and by him named *Bolbophyllum moniliforme* The plant was lost sight of until very recently, when it was rediscovered by a Mr. Fawcett on the Richmond river. The leaves of this pigmy orchid are sessile on a creeping rhizome, and often form bead-like stems—whence the specific name. The leaves are orbicular, flat, horizontal, and only one-eighth or one-sixth of an inch in diameter! Thus this orchid has the smallest leaves of any species in the whole order. Indeed, an observer, seeing the plant creeping among mosses, might readily take it for one of the Hepaticæ. The small red flowers are produced singly on peduncles hardly longer than the leaves, and measure only one-sixth of an inch. "While thus," says Baron Von Mueller, "East Australia possesses the dwarfest of all ochids, it counts among r ∧ its plants also the one with the minutest flower, namely, *Oberonia palmicola*."

§ 293. **Old Egyptain Vegetation.**—In the *Journal of Botany* for February an abstract is given of an interesting paper by the late Alexander Braun on an examination of the vegetable remains in the Egyptian Museum in Berlin. One of the most attractive questions leading to this examination was whether the vegetable remains, nearly five thousand years old, presented any important differences from present forms of the same species. It seems, however, that, with the exception of a few unimportant variations from the present forms of the fruits of the pomegranate, no actual difference exists between the ancient and modern specimens of the same species. Prof. Braun seems to have been led to make the examination through the remarkable discovery of Prof. Heer, of Zurich, that the flax found in the lake dwellings does not belong to the species now cultivated (*Linum usitatissmum*) but the *Linum angustifolium*, Huds., which is not now cultivated, although a native of the Mediterranean region, France, and Britain. That flax was cultivated in great quantities, and used in many ways in Egypt, is well known. Mummy cloths are always of linen, and priests were compelled to wear linen garments. Unger found a thread of flax in a brick from the pyramid of Daschur by which the cultivation of this plant is carried back 4,000 before Christ. What particular species of *Linum* was cultivated in Egypt is a point yet to be settled. *Linum angustifolium* has fruits and seeds only half the size of those of *L. usitatissmum*, so that the two are easily distinguished.

§ 294. **Death of Robert H. Brownne.**—We have to mourn the loss of an ardent lover of botanical science, in the death of Robert H. Brownne, which occurred Feb. 15, 1879, by apoplexy. He was born in this city August 3, 1810. His father was a prominent shipbuilder in the earlier part of the century, being the head of the firm of Brownne & Bell, who modelled and constructed for Robert Fulton the "Clermont," the first steamboat which navigated the Hudson River. Young Brownne had an ardent thirst for knowledge, and made good use of the advantages which he enjoyed at the New York High School, in which he was educated, and in which he for many years held a position as teacher. That institution was then under the charge of Dr. John Griscom and Rev. Daniel H. Barnes, both of them men of solid learning, "apt to teach," and well versed in physical and natural science, which previous to this period had been little taught in schools. Their enthusiasm in this direction and their personal magnetism gave most of their pupils a decided bent towards the study of nature. In early life Mr. Brownne was threatened with pulmonary disease, for which his physician prescribed active exercise in the open country. With the predilection acquired at school, it is not strange that he should now be led to take up botanical study as an additional incentive to the regimen prescribed. In 1833 he was elected a member of the N. Y. Lyceum of Natural History, and in 1837 he became its Recording Secretary, and continued to hold that office until a few years previous to his death. At the time of his entrance into this Society, its leading botanical members were Dr. Torrey, John Carey, Samuel T. Carey and Abraham Halsey, to whom soon after was added Dr Asa Gray—now so pre-eminent. Brought into constant association with such men, Mr. Brownne could not fail to profit by their fellowship, and he became throughly versed in the botany of the Northern and Middle States. But his attainments were not limited to that field. He acquired a good knowedge of geology, mineralogy and conchology. His reading became extensive, and his acquaintance with bibliography and numismatics were not often excelled. After the dissolution of the N. Y High School, he was appointed principal of the parochial school of the Scotch Presbyterian Church, which position he held to the day of his death. His reputation as an expert in mineralogy, conchology, bibliography and numismatics gave him wide employment in the work of arranging and cataloguing collections and libraries. For the last twenty-five years he had acted as librarian for Robert L. Stuart of this city. He was also Secretary of the North-western Dispensary. Modest and unassuming in manner, with every solid virtue and Christian grace, his memory is precious to those who knew him.

J. H. R.

§ 295. **Aspidium aculeatum in Pennsylvaninia.**—During the summer of 1878, Mr. J. P. Crozer Griffith found this fern growing freely in a rocky glen near the south-western corner of Sullivan Co., Pennsylvania. This locality is in a region elevated nearly 2,000 feet above tide, in latitude about 41° 15′. This is considerably farther south than has been noted for its occurrence in the United

States, the most southern localities previously known being in the Catskill Mts., N. Y. In Stony Clove, of those mountains, Mr. Redfield saw in 1865, and Mr. Isaac H. Hall has since seen it in the Kaaterskill Clove of the same mountains. J. H. R.

§ 296. **Publications.**—1. *American Journal of Science and Arts*, Jan. and Feb. From Dr. Gray's book notices we cull the following items. "The *Nelumbium* of South American proves to be *N. luteum* and the Japanese N. *nuciferum* is thought to be hardly different." "*Cucurbita Pepo* is thought to be of Asiatic origin; perhaps rightly. But our Indians had it, along with *Nicotiana rustica*, which is certainly an old-world species." The North American *Fungi exsiccati* of Messrs. Ravenel and Cooke, and of Messrs. Ellis and Farlow are noticed. The former may be obtained of H. W. Ravenel, Aiken, S. C., the latter of J. B. Ellis, Newfield, N. J. The Botanical necrology for 1878 is a long list: Elias Magnus Fries, of Upsal, aet. 84 ; Ludwig Pfeiffer of Cassel, aet. 72 ; Andrew Murray of Edinburgh, aet. 66; Andrew Bloxam, English, aet, 76 ; François Vincent Raspail of Paris, aet. 87; Sulpiz Kurtz of Calcutta; M. Durieu of Bordeaux, aet. 82; Charles Pickering, M.D., of Boston, aet. 73; Moritz Seubert of Carlsruhe, aet. 60; Thomas Thomson of Glasgow (and India), aet. 60 ; Giovanni Zanardini of Venice, aet. 74 ; Roberto de Visiani of Padua, aet. 77 ; Barthelemy Charles Du Mortier of Belgium, aet. 82; Elias Borszczow of Kiew (Russia); James McNab of Edinburgh, aet. 69 ; Stephen T. Olney of Providence, the Caricologist, aet. 66 ; James Watson Robbins, M. D., of Uxbridge, Mass., the authority on Potamogetons, aet. 77; James Bigelow, M. D., of Boston, "the most venerable of botanists," and of whom Dr. Gray promises a fuller notice. We are promised a notice of Dr. Robbins. 2. *The Botanical Gazette*, Jan. and Feb. Dr. Vasey describes a new Panicum, *P. littorale*, found by Mr. Charles Mohr of Mobile on the drifting sands of the Gulf coast. Mr. Coulter has been exploring the flora of Northern Indiana, Mr. Curtiss the Shell Islands off the coast of Florida. 3. The *American Naturalist*, Jan. and Feb. Prof. J. E. Todd writes on "certain contrivances for cross-fertilization in flowers," Iris, Martynia, Penstemon, Lobelia ; John A. Ryder, on the ultimate physical unit of living matter; Alfred W. Bennett, on the "Absorption of water by the leaves of plants;" Moses N. Elrod on "Seeds of the Violet and other plants as projectiles." 4. *American Quarterly Microscopical Journal*, Hitchcock & Wall, 150 Nassau St., N. Y., contains several articles of interest ; The classification of the Algae, with plate, Rev. A. B. Harvey ; Forms of Saprolegnieae, continued, Frank B. Hine ; Classification of the simplest forms of life, B. Eyferth.

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The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club may be found at* 245 *Broadway.*

BULLETIN OF THE TORREY BOTANICAL CLUB.
Vol. VI, Nos. 50, 51.] [New York, March, 1879.

§ 297. **A New Hawaiian Fern.—Hymenophyllum Baldwinii.**—Subspithamæum: frondibus lanceolatis vel ovato-lanceolatis læte viridibus tenerrimis bi-tripinnatifidis; pinnis primariis oblique-divergentibus plerumque rachi anguste alatæ adnatis inferioribus solutis; pinnulis simplicibus vel in segmentis paucis oblongis obtusis emarginatisve margine integerrimis nudis divisis; segmentis infimis cujusdam pinnulæ abbreviatis apice soriferis; involucris subrotundis fere ad basin usque brevem alatam bilobis, lobis integerrimis, receptaculo columnari; stipite brevi rachique basin versus pilis rufis subulatis hispidis.

Abundant in a little valley in Oahu, at 2,500 feet above the sea; Hon. D. D. Baldwin, 1878. The rhizoma may be elongated and creeping, but having seen only the ends of rhizomes bearing half a dozen clustered fronds, I am unable to say whether it is long or short. The fronds are from three to six inches long, the shorter ones lanceolate and bi-pinnatifid, the larger ones ovate-lanceolate and tri-pinnatifid. The very short and hirsute or hispid stalks, and the shorter and more delicately membranaceous segments will easily distinguish it from *H. recurvum*. *H. scabrum*, of New Zealand, is a larger and coarser plant, and has the hairs of the stalk heavier and composed of very short articulations, while in *H. Baldwinii* the hairs have very long joints, and taper from a slightly swollen base to a long and very delicate point. I take pleasure in naming it for a gentleman who has shown great interest in the cryptogamic vegetation of the Hawaiian Islands.

Mr. Baldwin has also sent specimens of *Trichomanes pyxidiferum*, Linn., a species which is, I believe, new to the Hawaiian Islands. He reports that it is abundant in certain localities in Maui. **D.C.E.**

§ 298. **A few notes on the abnormal absence of color in plants.**—In the few observations which follow, it is not expected that anything new will be found; the object is more to call attention to a few facts which seems to have been generally passed over in botanical researches as devoid of interest. The whole subject arranges itself under two heads. The first will comprise true "albinos," or such plants as have spontaneously, in a state of nature, lost their colors and become white flowered. The second relates to those plants in which the colors have been more or less eliminated by artificial means.

First then, we have to consider those "sports" of nature where there has been a sudden change, without any intermediate steps, from a plant with colored flowers to a pure white variety; which change, for want of a better term, we call "spontaneous." Such may be aptly termed "negative" varieties, since their peculiarity is due rather to an *absence* of their normal color, then to the *presence* of white.

It is nothing uncommon to see, in many species, a gradual change from a brightly colored individual, through successive lighter and lighter ones, until a pure white is reached. This may be seen very well in *Hepatica triloba*, which comprises individuals of every shade of color from dark purple to white; or in *Polygala sanguinea*, in which we find the same gradual change from a dark red. But such cases do not concern us, as it is often difficult to determine which is normal with them, color or the absence of it.

The following list of "albino" plants is made from specimens collected during the last three years.

Vernonia Noveboracensis; Willd; Richmond, S. I.,1876.

Lappa officinalis, var **major**; not uncommon.

Lobelia syphilitica, L.; in a limited locality, near Clove Lake, S. I., can be found every year and seems in a fair way to perpetuate itself.

Epiphegus Virginiana, Bart.; a small clump near Four Corners, S. I., always comes up in the same spot each season.

Verbena hastata, L.; Gifford's, S. I.,1877.

Asclepias incarnata, L.; generally produces a few white flowered plants each year in the Clove Lake Swamp, S. I.

Trifolium pratense, L.; occurs rarely.

Brunella vulgaris, L.; A few scattered specimens may generally be obtained every year on S. I.

Both *Gentiana crinita*, Froel, and *Lobelia cardinalis*, L., have been reported to me as having produced at times albino forms, but I have never seen them personally. I have not included in this list *Verbascum Blattaria*, L., as in some localities I have found the white variety almost as plentiful as the yellow. All the others mentioned, however, may be considered as true "albinos" and from them we may learn some curious facts, and open an interesting field of study.

Now, in the first place, not only does the flower show the characteristic absence of color, but the leaves, stem, and, in fact, the entire plant, are invariably of a lighter green ; and if any red or purple color should be normal to the stem (which is often the case) this also is of a lighter shade. Thus even the superficial appearance of the plant will strike the observer at once. Secondly, if we have under consideration a plant which commonly is known to have juice of an acrid or peculiar taste, this is generally more or less absent in the albino form, and sometimes is eliminated entirely. Darwin has noted this fact, and, in commenting upon it, says that honey bees evidently are aware of it, for they perforate the calyx and corolla of the white Aconitum Napellus, to get at the nectaries, but will not do so with the colored ones. For this reason, perhaps, we bleach celery and rhubarb to get rid of their strong flavor : in both cases the loss of the strong taste is accompanied by the absence of color. It has often been urged that these albinos are mere "sports" of Nature, with nothing constant about them ; their peculiarities due, often, to growing in the shade, &c. In fact, that it is a condition due to bleaching or insufficient sunlight, and that there is nothing of it inherent in the constitution of the plant. Fortunately I have been able to test this. In the case of *Lobelia syphititica*, I first found the plants in the shade of some rather thick underbrush, in the month of September. This growth was cut down the following spring, and the place opened to the full glare of the sun. This was done three years ago, yet, every autumn since, these plants have either reappeared, or else left offspring which have inherited their albino nature. This shows them not only constant in their peculiarities, but also that these are bred in the plant and capable of inheritance. *Epiphegus Virginiana* and *Brunella vulgaris* offer the same proofs. Nor has the influence of locality much or anything to do with it, for a plant of the Lobelia syphilitica, which originally grew in a swamp, was transplanted to a comparatively dry garden a mile or more away, yet came up and blossomed white the next year.

Let us now see what the experience gained in the cultivation of white varieties can tell us. Probably the Japanese have brought the art of eliminating color from plants to the greatest perfection. Scores of species and genera have been by them variegated in the most peculiar manner. But this is never constant in this country, but after a while always tends to revert to the primitive color again. The elimination of the green color from leaves has been sometimes carried to such an extent that no color is visible except a faint shade along the midribs. When this degree is reached it is fatal, and not only does the plant become unhealthy and generally die, but it is impossible to perpetuate its peculiarity either from seeds or cuttings. In the case of Geraniums with variegated white and green leaves, I have been told that it seems necessary for the green to be in the middle of the leaf and the white in the form of a band around it. In this case the variety can be propagated, but if the white should take possession of the middle, and crowd the green to the edge, it cannot be. It seems necessary for the green color to have possession of the midrib. The effect of an increase in light and heat is very marked, and florists have to be continually on the lookout, when a variety of any plant is obtained, that it does not revert back to its normal color. Carnations, which are perfectly white during the cool autumn and winter months, will frequently become red streaked in a greater or less degree, as soon as the sun has gained increased power of light and heat in the spring.

From these facts we may conclude that Nature resents all attempts at the elimination of color from plants, and that this elimination is at the expense of the vitality of the plant, to a greater or less degree, and depends upon the same laws that relate to albinos in the animal world, which are proverbially weaker than their colored kindred. Even in those albino plants which occur in a state of nature, the growth and vigor is conspicuously less than that of colored individuals immediately beside them, although the number of the former would perhaps exclude this as a fair comparison. As there seems to be no tendency to reversion in these natural albinos, they might perhaps be made permanent varieties and be valuable on that account. No doubt this permanence is due to the change being sudden, leaving no trace of color by intermediate steps, while in cultivated examples the white has generally been obtained by a gradual selection of less and less darkly colored ones, and hence there would be a greater tendency to reversion back through these steps again. Besides this, in a state of nature the organs of fructification are secure, and hence the plant may propagate from its seed, while artificial selection and cultivation is frequently at the expense of these organs, and the perpetuation of the variety necessarily becomes dependent on cuttings, which frequently fail to grow into plants inheriting the peculiarity of the parent stock.

A chemical analysis of the ashes of albino plants would perhaps throw some light on the subject, by showing if the difference in color can be accounted for by a difference in the elements absorbed by the plants; but, even could this be shown, the question would still remain: "Why should an individual plant refuse, apparently to its own detriment, to absorb something that other plants of the same species find necessary?" ARTHUR HOLLICK.

Read at the Meeting of the Torrey Bot. Club, Mch. 11th, 1879.

We find from NATURE, Nov. 28, 1878, that a paper was read on this subject by Prof. Church, before the London Chemical Society, in November last. The author had made numerous analyses of white and green leaves of the same age from the same plant, in order to discover whether any difference in their composition could be detected. The leaves were gathered from the maple, holly, ivy, and three exotic plants. White leaves contain more water than corresponding green leaves, whilst the ash of white leaves contains more potash and phosphoric acid, but less lime, especially less oxalate and carbonate of calcium. Nearly sixty per cent. of nitrogen in the white leaves is non-albumenoid, while the green leaves contain thirty per cent. of nitrogen in that state. The authór also analyzed a vegetable parasite, the dodder, and its host, the red clover; he found that the white leaves resemble in composition the parasite, while the host represents the green leaves. The white leaf is therefore, in a sense, a parasite on the green leaf, and owes its existence to its connection with the normal portion of the plant. W. R. G.

§ 299. **Botanical Notes.**—Dr. L. Rabenhorst has recently retired from the editorship of the CRYPTOGAMIC JOURNAL, *Hedwigia*, and is succeeded by the well known Mycologist, Dr. George Winter.—A new quarterly journal devoted to the interests of students of fungi has recently made its appearance. It is called the *Revue Mycologique*, and is edited by M. C. Roumequere, of Toulouse. The first number, which is very interesting, contains an article by the editor on the lichen theory of Schwendener which he condemns; another article treats of the culture of various species of Agarics in Japan; and these are succeeded by other articles both original and selected, and notices of new books.—From the beginning of the present year, Prof. A. de Bary assumes the sole editorship of the *Botanische Zeitung*. —To a recent number of the *Science News* Mr. John Robinson communicates an article entitled "The Botrychia not Ferns," in which he states that "It should be more generally known by collectors that *Opioglossum* and *Botrychium* are not true ferns, and that they should be looked upon rather as fern-allies, for they differ from the *Filices* more than the *Equiseta*, and as much as most *Lycopodia*." As reasons for his conclusions, he cites the differences in the mode of vernation, the difference in the growth of the prothallus, which, in the *Ophioglossaceæ*, takes place under ground—the prothallus being very small, destitute of chlorophyll, and having but few root-hairs, while in the true ferns the case is exactly the reverse. There is a greater thalloid development in ferns than in the *Ophioglossaceae* and a difference in the evolution of the spores. He would, therefore, place the *Ophioglossaceae* in an order of equivalent value with the *Filices*, but in advance of them in a system of classification, inasmuch as they are in some respects more highly differentiated than the latter. —The *Library Journal* for November contains an article by Prof. Ezra Abbot, of Harvard University, showing to what extent many of our standard works of reference continue to perpetuate the old and erroneous view as to the papyrus (*Papyrus antiquorum.*) For instance in "Adam's Roman Antiquities" we read that this plant was "abut ten cubits high, *and had several coats or skins above one another, like an onion*, &c." In Smith's "Dictionary of Greek and Roman Antiquities," under the article *Liber*, the writer says: "The *papyrus-tree* grows in swamps, &c.," and that "paper was prepared from the *thin coats or pellicles which surround the plant.*" Liddell and Scott's Greek Lexicon defines *βίβλος* as "the *inner bark* of the papyrus." A similar account is given in the Lexicon of Jacobitz and Seiler, Pape, and Rost and Palm's edition of Passow under *βίβλος* and *πάπυρος;* so also in many encyclopaedias. *e. g.*, the "Encyclopaedia Britannica," and others. This common error of speaking of the *papyrus* as if it were an exogenous plant (and even a *tree!*) has originated from ignorance or forgetfulness of the elements of botany, and the consequent misinterpretation of the passage in Pliny (*Hist. Nat.* xiii. 11–13, al. 21–27), which is our chief source of information about the ancient manufacture of paper from this plant. One of the words Pliny uses to describe the thin strips into which the *cellular substance of the stem* was sliced in making the paper is *philyra*, which strictly denotes the inner bark of the Linden tree (*Tilia*), also used as a writing material. Hence the papyrus has been conceived of by the eminent authorities above cited as an exogen, with its inner and outer bark!

W. R. G.

§ 300. **Epigaea repens,** L.—I found specimens of this plant in full bloom at Princes Bay, S. I., on Saturday, Mch. 1st. I do not know that it has ever been found earlier in this locality.

A. H.

§ 301. **Anychia dichotoma,** Mchx., **not dichotomous.**—I do not know whether attention has already been called to the fact, that the specific name of this plant is really a misnomer, if we take the term, "dichotomy," in its strict scientific signification.

If we examine younger specimens of our Anychia, we invariably find every axis terminated by a *flower*, with a branch on each side from *lateral* buds *below* the apex. Hence this is a plain case of cymose, not of dichotomous ramification. In older specimens, say toward the end of July or in August, when many of these terminal flowers have fallen off, the main stem and many branches appear bifurcated. But I need not repeat that this cannot be called dichotomy, which only occurs when some axis, *at its very apex*, is "cut into two" branches, which may again be divided in the same manner, and so on.

Now, although I commonly agree with those who believe in the celebrated words, "What's in a name?" still I think scientific names ought not to be apt to create erroneous impressions, especially in reference to such important facts as the structure of the body of a plant. JOS. SCHRENK.

College Point, L. I., March 11.

§ 302. **Non-cellular Plants.** [The following lines are translated from a proof-slip lately received in a letter from Prof. Jul. Sachs. JOS. SCHRENK.]

Prof. Sachs demonstrated a number of plants of the order Siphonaceae before the Physico-medical Society of Würzburg, and remarked that these Thallophytes, together with the Mucorinaceae, are as yet considered as *single celled* plants, that is to say, as plants consisting of but one cell. This is correct, Prof. Sachs says, if by the term "cell" we understand a body which has originated by growth and is surrounded by a cell-membrane containing protoplasma. But as we can observe that the growth of the Siphonaceae and Mucorinaceae is not accompanied by corresponding cell-divisions, as is the case with nearly all other plants, but takes place without any such divisions, it seems more natural to consider them as *non-cellular* plants—as plants whose interior is not divided by partitions, and whose protoplasma is not parted nor gathered around numerous centres. In this respect the Coeloblasts without any nuclei (Siphonaceae, Mucorinaceae and others) differ materially from other so-called single-celled plants, such as the Desmidiaceae, Bacillariaceae, etc., the growth of which is accompanied by rhythmically repeated divisions; only with them the different compartments of the cell separate from one another at once, and may live as "single-celled" plants.

§ 303. **Agaricus chlorinosmus, Peck.**—It seems to me far more probable that the fungus, noticed in the BULLETIN for December, was exhaling chlorine, when found, than a hitherto unknown substance with its exact odor. Plants are said to exhale ozone, which has the same disinfectant properties as chlorine, but a different odor. Is not the odor one of the most delicate and reliable tests for free chlorine? and would not the same line of argument which rejects it also reject all other tests? Is the odor of Eschscholtzia juice *exactly* like that of muriatic acid? C. F. A.

§ 304. **Publications.**—1. *Ferns of North America*, Parts xii and xiii, S. E. Cassino, Salem, Mass. It is some time since we called attention to this beautiful and low priced publication, which no student of our ferns would willingly be without. The present instalment contains plates and descriptions of eleven species with their varieties, viz: Aspidium acrostichoides; Pteris aquilina; Asplenium trichomanes, A. viride, A. parvulum; Adiantum Capillus-Veneris, A. emarginatum; Vittaria lineata; Notholaena sinuata, N. ferruginea, N. Newberryi. It seems that Adiantum Capillus-Veneris and Asplenum parvulum have recently been found in Greene County, Missouri, by Prof. E. M. Shepard. This is their highest northern range, about 37°, except the Kentucky station for the Asplenum mentioned below. As regards Pteris aquilina, var *caudata*, a variety which has been reported as growing near Manchester, N. J., we quote

Prof. Eaton's remarks, for the convenience of hunters after this fern. "Var. *caudata*, a West Indian fern, is not rare in Florida, and has been collected in Southern Alabama, and perhaps in others of the Gulf States." "Fronds glabrous on both sides or even somewhat glaucescent; pinnules and segments very narrow, the terminal ones much elongated."—2. It is somewhat late to notice Prof. John Robinson's "*Ferns in their Homes and Ours*," published by S. E. Cassino, Salem, Mass., and Dodd, Mead & Co., New York, but we cannot refrain from adding out testimony to the value and beauty of this little work. Fern collectors are at this period much favored. We have received from Prof. Eaton the list of *Fendler's Ferns of Trinidad*, reprinted from the *Botanical Gazette* of Nov. 1878, which are for sale at the Herbarium of Harvard University; Mr. Davenport's *Annotated Catalogue of North American Ferns*, advertised in our last, will soon be out, if it is not already published, and Mr. Williamson of Kentucky advertises us that John P. Morton & Co. Louisville, Ky., will shortly issue a handsomely bound volume of sixty-three *Etchings of the Ferns of the Northern United States.* The etchings will be printed on the best Whitman's paper, 8x9 inches, and will include all the Ferns that have been found in the Eastern and Middle States, *i.e.* the ferns of Gray's Manual. The author has been induced to undertake this work by correspondents who were desirous to obtain the illustrations from the original plates. The price for the work will be $7.50 per copy, including mailing. Every impression will be an artist's proof. There will be no letter press. A specimen illustration will be mailed to any address on the receipt of fifteen cents. Mr. Williamson writes that he has added three ferns to his Kentucky list; Asplenium parvulum, A. ebenoides, and Cheilanthes Alabamensis. This is the highest northern reach for the first, and a new locality for the rare and suspected second. —3. *Catalogues. Flora of Richmond County, New York*, by Arthur Hollick, Port Richmond, and N. L. Britton, New Dorp, New York. Price 50 cents. This is a list of about 1,000 phaenogamous and vascular cryptogamous plants, growing without cultivation on Staten Island, with occasional notes on the same. Quite a number of these are only known from a collection made for the late Dr. S. Elliott of New Brighton, the localities having been destroyed. Some others have been reported on authority, notably of our own Catalogue of Plants around New York, but by far the larger part have been personally verified by the authors. No doubt, many other species will be added in time, *e.g.*, *Carex subulata*, Mchx., has been found in swamps near the railroad by Dr. T. F. Allen and ourselves. Some of the species admitted, on the other hand, may perhaps prove to be wrongly determined, we cannot help suspecting *Viola delphinifolia*, Nutt., for example, notwithstanding our respect for the opinion of the finder. We are surprised to find *Silene antirrhina*, L., rare on the Island, as we infer from its being reported from New Brighton only, on the authority of Mr. G. W. Wright. *Opuntia vulgaris*, Mill., is probably *O. Rafinesquii*, Englm., see the note from Dr. Engelmann, BULLETIN, II., p. 34. *Lonicera parviflora*, Lam., certainly grows on the Island, though not reported. It is interesting to find *Linnaea borealis*, Gronov., reported in the Elliott Collection, and that our authors have themselves seen *Valeriana sylvatica*, Richards, and *Chiogenes hispidula*, Salisb., so near New York. There are many other points of interest which we have no space to notice. The Catalogue is a valuable one and adds much to our knowledge of the flora of New York. The zeal and enterprise of these young young botanists, is one of the many evidences we see about us, that the great example of Dr. Torrey will not be forgotten in his native city.—4. *Catalogue of Phaenogamous and Vascular Cryptogamous Plants, collected during the Summer of* 1873 *and* 1874 *in Dakota and Montana, along the* 49*th parallel, by Dr. Elliott Coues, U.S.A.; with which are incorporated those collected, in the same region at the same times by Mr. George M. Dawson: by Prof. J. W. Chickering, Washington, D.C.* From the Bulletin of Hayden's Survey. "This Catalogue comprises 692 species, besides quite a number of varieties, and is of much value and interest, not so much for the number of new species enumerated as for the information supplied respecting the range of many species known to be common farther east, west, or south." "Doubtless a careful examination of certain localities through the entire season would add many species to the list, but the present catalogue serves very well to convey to the botanist a good idea of the characteristic flora of the 49th parallel.—5. *Woolson & Co.'s Descriptive Catalogue of Hardy Perennial Plants*, Spring and Fall of 1879, Passaic, N. J. For those who have the opportunity for cultivating them, we know of no better way of procuring most of our hardy perennials than from this extensive collection. It is not confined to American plants, but the supply of the latter is large and catholic, from the Atlantic to the Pacific, from *Ranunculus rhomboideus* to *Botrychium simplex*.—6. Those who want *botanical books* can procure almost anything from *R. Friedlaender & Sohn*, 11, Carlstrasse, Berlin. Catalogues are sent us by Gustav R. Steichert, 766 Broadway N. Y.—7. S. E. Cassino, Salem, Mass., has issued his new advertisement of, *The Wild Flowers of America*, illustrated by Isaac Sprague, text by Prof. George L. Goodale. The work is promised to consist of twenty-five parts, to be issued at intervals of from one to three months. Each number will contain two plates and from twelve to sixteen pages of text. The publisher, whose reputation is well established, promises that the plates "will surpass in beauty and excellence of workmanship any drawings of flowers ever published in any country." When we consider that the editor is Prof. Goodale, distinguished not only for his scientific knowledge, but also his success in presenting it, and the artist the unsurpassed Sprague, the price, one dollar and fifty cents a part, at considerable intervals, seems low enough to suit even the present times.

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Vol. VI., No. 52.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Apr., 1879.

§ 305. NOTES ON HEPATICOLOGY by C. F. AUSTIN.

Frullania Donnellii, *n. sp.*—Autoica, rufescens, fere minima generis, caule cum filis longissimis nigris cornicularioidis (forsitan ad *Fungos* pertinentibus) intertexto confertim simpliciter pinnatim vel subfasciculatim ramoso, ramulis brevissimis subsemierectis obtusissimis, foliis ovato-rotundis covexiusculis obtusis integerrimis contiguis vel imbricatis, auricula majuscula oblongo-clavata vel subcylindrica a caule distante et cum eo subparalleli vel deflexa (haud divergente), lobulo interjecto subulato minutissimo, amphigastriis caule duplo latioribus subobovatis bifidis, lobis obtusiusculis, perianthio obcuneato-oblongo, dorso planiusculo, ventre versus apicem compressum truncatum apiculatum brevissime unicarinato, foliis amphigastriisque involucralibus magnis profunde inciso-serratis: androecium minutum globosum brevipedunculatum.

East Florida, Mar. 1877. Capt. *J. Donnell Smith.*

A very small species, readily distinguished by the characters above denoted. Auricle longer and more distant from the stem, amphigastria wider, involucre larger and incised-serrate, perianth less expanded at the apex and somewhat different in texture, male spike globose and somewhat hidden under the leaves, otherwise much like *F. Knuzei*, var. (*F. Drummondi*, Tayl.).—*F. fragilifolia*, TAYL., (*F. polysticta*, MONT., *F. Sullivantiæ*, AUST.) is also of about the same size, but the ramificationis more vague, leaves narrower and marked by a medial line or patch of bead-like cells, auricle shorter and close to the stem, involucral leaves much less deeply serrate, perianth composed of much smaller cells, &c.—*F. gymnotis*, NEES. (*F. macularis*, TAYL., *F. Leaana*, AUST., a tropical species, erroneously attributed to this country by me, through a specimen in Herb TAYL., from Para, Brazil, but labelled "Cincinnati, Ohio,") has the leaves apiculate and composed of more oval cells, those at the base conspicuously enlarged, auricle twice as distant from the stem, branch leaves smaller and more closely imbricated, &c.

Frullania (*Jubula*) **piligera.**—*F. Hutchinsiæ* var. *β*, Synop. Hepat. p. 426.—*F. Hutchinsiæ* proxima; differt tamen foliis minus rotundis apice magis minusve piligeris (pilis 1–3–6 longis) reti magis ovali, auricula magis clavata, amphigastriis angustioribus, etc.

Sandwich Islands, *Baldwin* (*Eaton*). Java. (*Synop. Hepat.*)

Radula Caloosiensis, *n. sp.*—Dioica, flavicans; caule brevi rigidulo arcte repente parce ramoso vix subpinnato, foliis convexis (tumidulis) integerrimis vel obscure crenulatis obtusis, margine plerumque gemmiparo, lobulo inferiore majusculo subacuminulato vel obtuso sæpe subundulato margine interiore cauli adnato et supra eum subprotracto, reti fere ut in *R. complanata* mediocri, cellulis subæqualibus hexagono-rotundis supra convexis farctis valde opacis intercalaribus angustioribus hyalinis, perianthio breviusculo e basi obconica late oblongo-quadrato valde compresso, dorso lenissime convexo, ore bilabiato, labiis fere integris subdecurvis; spicula masc. longiuscula laxiuscula subinterrupta.

Caloosa, Florida, March, 1878.

Allied to *R. quadrata*, Gott., and *R. Xalapensis*, Mont.; but the lower lobe of the leaf is smaller and much less undulate or not at all so. Very near *R. affinis*, Gott.; but the perianth is broader and shorter from a longer obconic base, and not subcontracted below the more entire apex; cells of the leaves not unequal, &c. About the size of the usual forms of *R. complanata*, Dum., and in general apearance resembles it very much, but is of a fine yellow color, perianth more obconic at the base, inflorescence different, &c.; cells of the leaves and gemmæ on their margin much the same. In some of its forms it is difficult to distinguish from *R. australis*. Aust., which grows throughout Northern Florida, but was not found in the Caloosa Country. But this species is usually of an olive green color verging on to yellow or fuscous; the male spike is longer and more compact; the perianth is longer and narrower; both lobes of the leaf are a little smaller, the lower one is less adnate to the stem, and never undulate, the cells are somewhat smaller, not convex above, usually with a minute pellucid point in the centre, and the interstices are broader and less hyaline.

Gottschea Jamesii, *n. sp.*—Magnitudo plantarum submediocris. Folia imbricata, lamellata, ciliata, subcomplicata, mediocriter (pro genere) laxa apice inæqualiter emarginato-biloba, lobo superiore brevissimo obtuso, apice plano haud lamellato subrecurvo. Amphigastria palmatim (circa 5-) lobata, lobis canaliculatis ciliatis. Lamellæ foliorum interruptæ, ciliatæ, aliæ longiusculæ, aliæ brevissimæ et sæpe (præcipue illæ supra medium lobi superioris) ad cilias singulas reductæ.

Chili. Amiciss. T. P. James, dedit.

Herberta sanguinea.—*Sendtnera juniperina, var. δ, sanguinea*, G. L. N. Syn. Hep. p. 139. Differt ab *H. juniperina*, (Sw.); foliis vix vittatis basi minus ciliatis, reti majore, intercalaribus multum latioribus opacis, colore sæpe sanguinea, etc.

Sandwich Islands, *Mann & Brigham*, No. 63. *Baldwin*, Nos. 15 and 98.

Mastigophora Californica.—*Lepidozia? Californica*, Aust., in this Journal, Vol. 6, p. 19. (Mar., 1875). Prof. Macoun collected this on rotten wood on Vancouvers Island, in 1875. His specimens are of a red color, and remind one of *Blepharozia ciliaris*.

Cephalozia nematodes, Gott.—in Hepat. Cuben. Wright., under *Jungermania*. This species is not uncommon on the banks of ditches, margins of swamps, etc., in Florida and Southern Georgia. It has much the appearance of *Blepharostoma trichophyllum* (L.) Dum; but the texture of the whole plant is much more lax, the leaves are longer and more distant, the amphygastria are smaller and biparted (2–3 parted?) with their apices incurved, and the fruit is situated on a short ventral branch.—*C. confervifolia* Gott. l. c., has a more solid stem, smaller biparted confervoid leaves and no amphigastria; besides it grows on rotten wood, and has not yet turned up in our country.—[*Zoopsis argentea*, H., & T. = *Cephalozia argentea*, Lindb.]

Odontoschisma subjulacea.—*Jungermania caudifera*, Tayl. Mss, ex parte. Plantae dense caespitosae saturate virides nigro-purpureo variegatae; caule arcuato-erecto subjulaceo apice nonnunquam parce gemmigero (vix caudifero!), foliis rotundo-ovalibus arcte imbricatis semierectis, incurvis valde concavis vix marginatis, reti *S. denudatae*, amphigastriis (quæ semper adsunt) minutis ovato-triangularibus plerumque purpureis; radiculis nullis: fructu—?

Australia, *Drummond.* Sandwich Islands, *Baldwin* (*Eaton.*)

Resembles *O. denudata* (Nees) (*O. Hubeneriana* Rabenhorst), with which Taylor confounded it, in size and in the reticulation of the leaves; but differs in its suberect subjulaceous scarcely caudiferous stems, more concave subinvolute leaves and in the uniform presence of amphigastria.

O. prostrata (Nees) (*O. longiflora*, Tayl.) occurs in the Southern States (rare). The specimens given under this name in Wright's Cuban Hepaticæ mostly belong to *O. Sphagni*, (Dicks).

Jungermania Mauii, *n. sp.*—Saturate viridis; caule erecto (semper?) 6–8 lineas longo, foliis orbiculatis imbricatis lineam et ultra latis immarginatis flaccidis subdecurrentibus subpatentibus grosse subrotundo-areolatis (intercalaribus crassis) apicalibus appressis in gemmulam confertis, perianthio (immaturo) incluso subplicato ore denticulato, radicibus purpureis; florescentia dioica?

Maui, Sandwich Islands, 1876, *Baldwin* (*Eaton*).

Allied to *J. Abyssinica*, *J. hyalina*, &c. Somewhat like *J. cordifolia*, Hook., in general appearance but of a different (not fuscous) color; leaves more imbricated, more rotund, more lax, etc.

Steetzia subciliata, *n. sp.*—Dioica; fronde stipitata erectiuscula bi—trifida, laciniis oblongo-linearibus (6-8 lineas longis, 1-2 lineas latis) subundulatis in medio fusco-vittatis margine remote ciliata, ciliis erectis, apice obtuso siccitate constricto, costa tereti tenui sub apice desinente, involucro subbasilari inciso-ciliato (immaturo).

Japan, U. S. North Pac. Expl. Expd., under Com. Rodgers.

Differs from *S. Lyellii* in the stipitate, subciliate, thinner, less undulate frond, subbasilar fruit, etc.

Steetzia Baldwini, *n. sp.*—Dioica; fronde sessili vel substipitata divaricatim furcata integrave lineari vel obovato-oblonga valde undulata pallida margine integerrima per medium spatio lato obscura, nervo angustissimo tereti sub apice finiente, involucro inciso brevi, perianthio bilineari oblongo-cylindrico latiusculo pallido ore lacerato-ciliato, calyptra æquilonga nuda, capsula oblongo-cylindracea apice obtuse acutata trivalva (semper?) valvulis strictis; pl. masc. haud visa.

Sandwich Islands, 1876, *Baldwin* (*Eaton.*)

In the color and in the undulation of the frond like *S. cladorrhizans*, Tayl.; but that is smaller with a closer reticulation.—Perianth shorter than in *S. Lyellii*; arising from about the middle of the frond. Frond pale green, flattish, rather broad, an inch or more in length, broadly stipitate, rarely somewhat lobed on the margin, the whole of the middle part of it obscure. Elaters very long and slender.

Rhopalanthus, (*n. gen.* LINDB., Manip. Musc. Secundus, 1874, p. 390,) was wrongly printed "*Rhossalanthus*" on p. 21, Vol. VI, of this Journal. It is very closely related to *Scalia* (*Jungermania*) *Hookeri*, *Lyell.*

Anthoceros Donnellii, *n. sp.*—Dioicus; fronde plana subtenui lævi indistinctissime late nervosa profunde laciniata subcrenata subtus copiosisssime tuberosa, involucro magno infundibuliformi, ore inciso, capsula sporis et elateribus fere ut in *A*, *lævi.*

Banks of the Caloosahatchee River, Southwest Florida, Mar. 1878; rare.

Capsule and spores yellow; the latter smooth, or nearly so. Fruit very rare. Has much the appearance of *A. lævis;* but the divisions of the frond are narrower and more linear, and the involucre is much expanded above, characters which readily distinguish it. The frond is somewhat channelled when dry, and often becomes somewhat fulvous in the herbarium. The tubers are always present, usually numerous, and are attached to the frond by a longish umbilicus. They are minute, nearly round, furnished with a few short radicles, at first white, but becoming brown. They are not to be confounded with the descending tuber-like apex of the midnerve, which gives the specific name to *A. tuberosus*, TAYL.—a character which is not uncommon among the frondose Hepaticæ, and which sometimes occurs among the foliaceous ones.

Anthoceros Mohrii, *n. sp.*—Fronde crassa opaca elevato-lamellosa lacunosa margine elevato-crispata subtus dense radiculosa enervosa intus tuberifera, involucro brevi incrassato, ore truncato indistincte pluricrenato sæpe scarioso, capsula unciali crassa rigida luteo-brunnea vel subnigra varie curvata et torta longiuscule pedicellata, sporis ochraceis crebre minutissime papillosis opacis vel paulo pellucidis, elateribus valde difformibus aliis longusculis aliis brevissimis.

Port Royal, S. Car., Apr., 1878, growing with *A. lævis*, var. *major*, *A. punctatus*, var. *scariosus*, and *A. Ravenelii*. It has also been sent to me during the past year from Mobile, Ala., by *Dr. C. Mohr.*

Readily distinguished from the first of the above named species by its thicker subcristate frond, much shorter involucre not slightly expanded at the mouth when dry, shorter darker colored tortuous capsule, which ripens about one month later, smaller more papillose and opaque spores, and even more variable darker and broader elaters, &c. (Both the other species have black spores).

Both *A. lævis*, L, and *A. punctatus*, L, are common in the South —the former especially so,—where they mature in March, and usually grow more luxuriantly than at the North (where they mature in Sept. and Oct.), and they frequently have the mouth of the involucre scarious, a phenomenon seldom witnessed at the North, and which appears to be produced by frosts while this organ is in a young stage of growth. *A. lævis*, var. *major*, AUST. (*A. Carolinianus*, MX; *A. laciniatus*, SCHWEINITZ), is especially abundant on the Caloosa River. This and A. Donnellii were the only species found there. *A. punctatus*, var. *Eatoni*, AUST., was found on the

St. John's and Indian Rivers by Capt. Donnell Smith. It was also found in Cuba by Dr. Chas. Wright, and confounded with *A. lævis* in his Hepat. Cubenses. It is characterized by a subpellucid more or less nerved, subflabelliform often substipitate frond, with some of the perianths horizontal and more or less adnate with its upper surface. *A. Ravenelii*, AUST., was found from Middle Florida, to South Carolina. This species was originally described from rather immature specimens. *A. Lescurii*, and *A. Joorii*, AUST., are more mature states of the same species. It is readily distinguished by its thick black fronds, very thick capsules and large spores. The green capsule is over a half line in thickness, but shrinks greatly in drying, and does not regain its usual size in soaking.

Sphærocarpus Californicus, *n. sp.*—Dioica; plantæ humillimæ, cæspitosæ, suberectæ; fronde substipitata profunde lobata, lobis sæpe folioformibus, involucro oblongo vel subcylindrico breviter obtuse acuminulato, sporis *S. Michelii.* (*S. Berterii*, AUST., Exsic. n. 138, non BISCH.)—California.

Male and female plants usually (always?) growing together. Much like *S. Michelii*, BERNH.; but the frond is somewhat stipitate, and the involucre is more cylindrical and subacuminulate.

Thallocarpus, LINDB.; Cryptocarpus, AUST. Capt. Donnell Smith has collected a fine lot of this plant, (*T. Curtisii*) in Florida. It is diœcious. The male frond is furnished with "ostioles" precisely like some *Riccias*. Mode of growth also as in *Riccia*, in which genus it should probably be included as a subgenus. The adhering together in fours of the spores until long after maturity, as in *Sphærocarpus*, appears to be the only character in which it is decidedly different from *Riccia.*—I have examined many specimens of various species of *Riccia*, both in the growing and in the preserved state, searching long and carefully for the antheridia, without ever seeing them except in *R. Watsoni*, AUST., where they are both numerous and large, and are imbedded in the frond. I have seen the so-called *ostioles* only in *R. lata*, TAYL., *R. Donnelii*, AUST., and *R.* (*Thallocarpus*) *Curtisii*. In all these they are easily seen without the aid of a lens.—In *Sphœcocarpus* the antheridia are large and numerous, sessile, and enclosed (singly) in conical purplish involucres.—*Riccia reticulata*, SWARTZ., is certainly only the prothallus of some Fern.—*Vittaria?* Dr. Chas. Wright collected it on the trunks of Palms in Cuba, and some of his specimens are accompanied by young fronds of the Fern proper,—some of them an inch or two long. *Vittaria linearis*, in Florida, has a similar but much smaller prothallus, which somewhat resembles the young nerveless fronds of a *Metzgeria*. It is frequently met with on the trunks of the Palmetto, and is often accompanied by the young fronds of the Fern proper: in fact it appears to be always present among the rootlets of the mature fronds. A nearly similar prothallus, but rather suggestive of an *Aneura*, grows on the ground both in Florida and in Cuba, from which spring the fronds of some *Hymenophyllum*. Dr. Lindberg, in Hepat, Hibern. (Act. Soc. Fenn. X, p. 472), records some valuable observations on these things, and quite conclusively shows that they are diœcious prothalli of Ferns ("An ad *Hymenophylleas* pertinet?"), and considers them perennial. However, he winds up his remarks by saying that he leaves the whole matter in the greatest doubt (!) The form which Swartz referred to *Riccia* was referred to the *Lichenes* by Acharias, and to the *Algæ* by Aghardh.—There can be but little doubt that the plant described in this Journal (vol. VI, p. 188) by Mr. Wolle, as an *Alga*, under the name of *Poterophora Donnellii*, nov. gen. et sp., is also the prothallus of some dioecious fern or filicoid. In structure it too is much like a *Liverwort*; e. g. *Jung. confervifolia*. GOTT. [Almost from the beginning of my acquaintance with the Liverworts, I have been possessed with the fancy that the Ferns are but a higher development of them; also that they (the Liverworts) are but a higher development of the simpler *Algæ*.]

§ 306. New or Little-known Ferns of the United States. No. 6.

16. **Adiantum tenerum,** Swartz.—Distinguished from *Ad. Capillus-Veneris* by the broadly deltoid-ovate outline of the commonly much larger 3—4-pinnate fronds, and especially by having the ultimate pinnules articulated to their petioles, so that after maturity they all fall off, leaving the rachis and all its branches and branchlets bare of foliage. The ultimate pinnules vary from rhomboid to roundish-cuneate; they are usually less lobed than in the Venus-hair, and have rather short oblong or somewhat lunate involucres. The credit of the discovery is in great part due to Mrs. Dr. Barnes, of Syracuse, who found in a conservatory living plants which were brought from Florida by Mr. Christian Beh, who discovered them in March, 1877, growing about the opening of a "sink-hole" on the plantation of a Mr. Williams near Ocala. Mrs. Barnes, on seeing the plants, suspected something different from *A. Capillus-Veneris*, and sent me at first an imperfect frond, which I doubtfully referred to *Ad. tenerum*. In a few days she obtained much finer specimens, which she sent me, and herself pointed out the important distinguishing character of the articulation at the base of the pinnæ. It now appears that the same species was noticed on the Halifax river a long time ago by Mr. S. N. Chamberlin, who showed the plants to Miss Mary C. Reynolds in May, 1877. Miss Reynolds collected specimens at that time, and reported the fern as *Ad. Capillus-Veneris* in the BULLETIN of Sept. 1877, (p. 176), where she so well describes the habit of *A. tenerum* that I ought to have recognized the species from what she says about it. I received some of her specimens very lately from Mr. C. E. Faxon. Mr. Davenport has specimens from Ocala, gathered in 1878 by Mr. Shockley; and to-day I have before me a very fine and full set of specimens collected the present month at Ocala by Capt. J. Donnell Smith, who, with his characteristic generosity, has sent me his whole collection of Ocala Ferns to choose from for my herbarium.

Capt. Smith has sent with the *Adiantum*, fine series of specimens of *Asplenium myriophyllum* and *A. firmum*, *Pteris Cretica*, and a *Polypodium* which seems to be so nearly intermediate between *P. pectinatum* and *P. Plumula*, that I cannot at once decide what to do with it. With these are a few specimens of *A. Trichomanes* with large oblong pinnæ, much as in specimens from Bermuda and tropical America.

17. **Pteris Cretica,** L. The Florida plant, as exemplified in Capt. Smith's specimens, is identical with the Mediterranean species, and has the same "firm coriaceo-membranaceous" texture of the pinnæ. This fern has not been gathered in quantity before for several years, Mr. Shockley's specimens being few, and mostly without the rhizoma.

18. **Pteris serrulata,** L. fil.—This fern is announced in Mr. Davenport's new "Catalogue of the Davenport Herbarium of North American Ferns." It was discovered near Mobile, Alabama, by Mr. Charles Mohr about a year ago, and first identified by Mr. Davenport. Mr. Mohr has also favored me with specimens, but I preferred to say nothing about the discovery till Mr. Davenport should first make it public. I learn from Professor Lewis R. Gibbes, that a *Pteris* has sowed itself and grown abundantly on the walls of the College at Charleston, South Carolina. It will be very interesting to know whether this is *Pteris Cretica* or *Pteris serrulata.* That a fern may become an introduced plant is proved not only by the instance described by Mr. Davenport at the end of his most valuable and interesting Catalogue, but by the fact reported in the *London Times* that *Platycerium alcicorne* has appeared wild in at least three places in England and Wales, the last time in the Cader Idris Mountains.

19. **Asplenium ebeneum,** var. **proliferum.**—Rachis proliferous near the base of the frond. Many tropical *Asplenia* are known to be proliferous, but with the exception as *A. ebenoides* proliferous forms have not been hitherto noticed in the United States. Capt. Smith collected a few specimens of *A. ebeneum* near Ocala; and, looking at them closely, I find as many as three fronds with proliferous buds on the rachis just by the lowest pinnæ. One frond has three such buds, and from them young fronds one or two inches long have been produced. I find one frond, which I collected many years ago in Florida, similarly proliferous, though the young fronds have not shown themselves.

20. **Ophioglossum vulgatum,** Plumier. This plant, whether Fern or only Fern-ally, has been found again in Florida, this time near Manatee, and by the indefatigable Dr. Garber. His specimens are much the finest yet gathered in the United States. Dr. Chapman's original discovery was first noticed in the Torrey Club Bulletin of January, 1876, which notice was accidentally overlooked by Capt. Smith in his recent paper in the Botanical Gazette.

D. C. E.

§ 307. **United States Species of Lycoperdon.**—By Chas. H. Peck, A.M. (Read before the Albany Institute, Feb. 4, 1879. Pamphlet, pp. 34.) A revision of the American species of the genus *Lycoperdon* (*Anglicè* "puff-balls") has long been needed, inasmuch as the literature of the subject is somewhat scattered, and in many cases not easily accessible to the student. This work has at length been ably accomplished by Mr. Peck, in the monograph before us. The entire number of species thus far known to inhabit the United States, according to the author, is 23; and of each of these he gives an English diagnosis, followed by copious notes drawn from his own observations. It is perhaps known to Mr. Peck's correspondents that he has been devoting considerable attention to this genus for several years, and through his own collections, and from specimens communicated by friends, he has been enabled to study 21 of the species described (many of them variable) from the plants themselves. Four of the species, *L. coloratum*, Pk., *L. subincarnatum*, Pk., *L. Frostii*, Pk., and *L. glabellum*, Pk., are new to science and described here for the first time. Sixteen of the species enumerated are known to be inhabitants of New York State. Among the more important changes that have been made in the genus we note the following: *Lycoperdon echinatum*, Pers., is again raised to the rank of a distinct species from a variety of *L. gemmatum* to which it had been reduced by Fries; *L. molle*, Pers., which Fries had also made a variety of *gemmatum* under the name of *furfuraceum*, is here also considered a good species, and enumerated as such; *L. separans* Pk., (of the 26th Regent's Report) is here included under *L. Wrightii*, B. & C., as a mere variety of that species; *L. albo-purpureum*, Frost (*Borista cyathiformis* of the 23d Regents' Report) is decided to be the same as *L. cyathiforme*, Bosc.—a name which has the priority; finally, *L. calvescens*, B. & C., and *L. cruciatum* Rostk., although for the present admitted as species, are thought by Mr. Peck to be mere varieties of the very protean *L. Wrightii*, B. & C., and this opinion is formed from an examination of authenticated dried specimens. In conclusion, the author states that his *L. Warnei* has turned out to be a *Podaxon*, and must hereafter be called *P. Warnei* Pk.

Mr. Peck remarks that "'puff-balls' are useful because they are edible. None of the species are considered dangerous or even hurtful, yet some are so small and so scarce that they are not of much value for food. As an article of food they have this advantage over mushrooms; they are not often infested by insects or their larvae, and there is scarcely any possibility of mistaking deleterious species for them." He gives the names of six species, the edible qualities of which he has tested, but two of them (*L. gemmatum*, and *L. pyriforme*) he does not recommend, since they are not well flavored.

We trust the time is not far distant when we shall have further monographs of the fungi from so competent a pen as that of Mr. Peck; certainly there is no need of importing all work of this kind from foreign countries.

W. R. G.

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The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club may be found at* 245 *Broadway.*

§ 308. Notes on the Relative Age and Dimensions of a Number of Different Trees.

The subject of the annual growth of trees is one about which little seems to be known in comparison with its importance. Of course it is generally believed that there is a difference in different species in the amount of this annual increase of dimensions, but there is apparently nothing on record as to any exact observations of the number of years which must elapse before we may expect a sapling to become a tree of given dimensions. Having had opportunities during this past winter to measure a large number of trees, I have taken a series of notes on the subject, to the results of which I propose to call attention.

And first a short description of the methods employed in obtaining the measurements will not be out of place. Three separate notes were taken from each individual tree examined; (1) its age; (2) its height; (3) its butt circumference. The age has been determined either from actual knowledge of the date when the trees were planted, or by counting the annual rings in the case of felled trunks, which latter may be a year or two in error in a few cases, owing to the difficulty in counting when the rings are obscure or very close together. In regard to the heights, trees which are still standing were measured by means of horizontal base lines and the corresponding angles of elevations, which were taken with a rough instrument and are approximate, the error in the height amounting to perhaps three feet in extreme cases.

Trees which had been felled were measured directly by a tape line.

The circumferences of the butts were measured, in most cases, at about three feet above the ground.

These notes were tabulated, and those for each species averaged. Then assuming the section of the trunk to be a circle, average circumferences were reduced to corresponding diameters. By dividing the average height by the age, the average vertical growth per annum was obtained. Applying the same operation to the average diameter, the quotient gives the average yearly increase in the thickness of the trunk, at its base, and one-half of this is the average thickness of the annual ring for that particular species.

The notes were all nearly taken near New Dorp, S. I., over an area of perhaps three square miles, so that the differences in soil, rainfall, etc., must be small, and I think may be neglected.

It is to be born in mind that the average rates of growth given in the foregoing table do not apply to the trees at every period of their existence. All trees grow much more rapidly vertically when they are young; the yearly increase in diameter is a more constant quantity, but there is a slight decrease in the ring thickness as they grow older, which is especially noticeable in the case of old trees, and where much crowding has taken place. N. L. BRITTON.

The following table gives a summary of these observations.

NAME OF TREE.	Average Age in Years.	Average Annual Increase in Diameter.	Average Annual Ring Thickness.	Average increase in Height per year.	No. of Trees on which the Average was taken.	Relative Rapidity of Vertical Growth.	Relative Thickness of the Annual Ring.
Abies excelsa	32.6	0.61″	0.30″	1.73′	3	1	3
Salix alba	32	1.06″	0.53″	1.62′	3	2	1
Liriodendron	38	0.45″	0.22″	1.57′	1	3	13
Abies balsamea	30	0.38″	0.19″	1.56′	8	4	16
Juglans nigra	26	0.41″	0.20″	1.55′	2	5	15
Larix Europæa	34	0.29″	0.15″	1.53′	3	6	21
Pinus Strobus	27	0.51″	0.25″	1.52′	1	7	10
Acer rubrum	28.4	0.45″	0.22″	1.51′	5	8	14
Ailanthus	31	0.59″	0 29″	1.46′	11	9	4
Prunus Cerasus	29	0.54″	0.27″	1.40′	7	10	7
Catalpa	32	0.55″	0.28″	1.39′	5	11	6
Betula alba, *var.* populifolia	34	0.18″	0.09″	1.32′	3	12	26
Ulmus Americana	38	0.52″	0.26″	1.31′	2	13	8
Paulownia	31	0.58″	0.29″	1.29′	1	14	5
Aplpe-trees	23	0.65″	0.32″	1.23	6	15	2
Pinus mitis	38	0.45″	0.23″	1.18′	2	16	12
Pinus rigida	36.2	0.31″	0.15″	1.17′	5	17	20
Thuja occidentalis	28	0.32″	0.16″	1.15′	3	18	19
Castanea vesca	52.3	0 51″	0.25″	0.96′	7	19	9
Sassafras	27.1	0.23″	0.12″	0.96′	8	20	23
Carya tomentosa	70.4	0.20″	0.10″	0.95′	5	21	24
"Black Oak." (Q. rubra?)	37	0.47″	0.24″	0.94′	4	22	11
Quercus alba	47.3	0.35″	0.18″	0.88′	6	23	17
Fagus ferruginea	44.8	0.36″	0.18″	0.78′	5	24	18
Diospyros	52	0.27″	0.13″	0.67′	1	25	22
Juniperus Virginiana	59.7	0.21″	0.10″	0.58′	12	26	25

§ 309. **Vitis.**[1]—In the June number of last year I have enumerated some of the characters which distinguished *Vitis riparia* from *cordifolia*. I can now confirm all I have said there. Our present spring being later than the very precocious one of last year, *riparia* bloomed about May 10th and *cordifolia* begins now, May 27, to open.

Another, and a very valuable, character to distinguish *riparia* not only from *cordifolia*, but from all other species of *Vitis* has been

1 - See p. 316 for note.

indicated by Prof. Millardet of Bordeaux, and is fully confirmed by my observations made on specimens from all parts of their geographical area.

The dissepiments or diaphragms, as they are called, which at each node interrupt the medullary tissue, and which are best studied in vines of the previous year, are in *riparia* very thin, only ⅛ to ¼ of a line in thickness, while in *cordifolia* they are ½–1 line thick, and in *aestivalis* a little thicker yet.

Pursuing these investigations through all the species of *Vitis* attainable, I find that the Rocky Mountain *Vitis* and that from Lake Superior have been correctly referred to *riparia*, while *V. Arizonica*, about the relationship of which I had some doubts, is certainly distinct from *riparia*.

All true *Vitis* have such diaphragms at each node, while all the species of *Ampelopsis* and of *Cissus* are destitute of them. But the startling fact appears that *V. vulpina* of the South in this character is different from all other *Vitis* species and affiliates with *Cissus*, its pith being continuous and not interrupted.

V. cordifolia, thus completely separated from *riparia*, approaches, strange as it may seem, close to *aestivalis* in the character of the diaphragm, in its period of flowering, and even in its seeds, and the connection seems to be made by that western entire-leaved and small and black-fruited form of *aestivalis*, which I have distinguished as *cinerea*, to which downy-leaved forms of *cordifolia* approach almost too closely.

All the species of *Vitis* contain in their foliage more or less of a fragrant principle, most probably Cumarin, which the dried leaves retain with such tenacity, that even after fifty years in the herbarium they exhale this very distinct odor. In *cordifolia* I find it much more strongly developed than in any other species.

St. Louis, Mo. G. ENGELMANN.

§ 310. **Dr. Rugel**.—We have very lately received intelligence of the death of Dr. Rugel in Upper East Tennessee. He was a German sent to this country in about 1842, by Mr. R. J. Shuttleworth, to collect shells and plants for him, which Dr. R. did in Cuba, Florida, Texas, Georgia and Tennessee. Dr. Rugel was a good collector. Several of our North American Helices were discovered by him, as noted by Mr. Shuttleworth with the published descriptions—one species named *Helix Rugeli*. He seems to have been the only one who has detected the singular *Lechea divaricata* of Shuttleworth, one of the rarest of American plants, if indeed it is not a very peculiar form of *L. major*, as is barely possible. The only specimen we believe in this country is in Dr. Gray's Herbarium, unless there be one in Rugel's own collection. It was found near the Manatee River in Florida.

Dr. Rugel left a large collection of both shells and plants. Of the former many are not named, and the locality of some not given. The plants are in better order; they are labelled and catalogued. There are 3,000 or more European plants, and a large collection of American.

All these shells and plants Mrs. Rugel, Dr. R's widow, wishes very much to dispose of. Application may be made to Mrs. Geo. Andrews, Knoxville, Tennessee.

§ 311. **Ficaria ranunculoides,** DC.—In the Spring of '77 I found a small clump of this plant in a copse near Four Corners, Staten Island, N. Y. Last year I neglected to look for it, but last week, May 9th, I visited the locality and found it spread over quite a large area, evidently thoroughly established.

Asarum Canadense, L.—A peculiar abortion of this plant was found last week, with the calyx 4 cleft, instead of 3, and entirely devoid of stamens. The rest of the individuals in the same place had nothing unusual about them ARTHUR HOLLICK.

Staten Island, *May* 11.

§ 312. **Pteris aquilina,** *var.* **caudata.**—We have seen a specimen of this fern, which answers to the description in Eaton, and which was gathered in the neighborhood of Manchester, N. J., by, we believe, Mr. H. N. Mertz, of Erie, Pa.

§ 313. **Branched catkins of Salix.**—On May 10th, near Princes Bay, Staten Island, I noticed a group of sterile trees of Salix fragilis, L., a large number of the catkins of which were branched, some into two and some into three divisions. The branching took place about half way up the catkin. Mr. G. M. Wilber tells me that he has observed a similar branching of the catkins on other species of willows. Is this of frequent occurrence, and what is the cause? N. L. B.

§ 314. **Helianthemum Canadense,** Mchx.—Perhaps it is not generally known that the stem, the leaves and the calyx of the above named plant are densely covered with *stellate* hairs. This is interesting, I think, both as characterizing the species (genus?) and as furnishing fine microscopical objects for the admirer of the beautiful in Nature. JOSEPH SCHRENK.

College Point, *May* 19.

§ 315. **Androgynous Alder.**—A young lady, to whom I had brought some "alder tags" the other day, coaxed them into bloom in the house. Being an acute observer, she noticed and pointed out to me the fact that one of the staminate catkins was pistillate for the upper half of its length. Of course, as these catkins are pendant, the staminate flowers were *in effect* above the others. I never happened to see this androgynous condition, but, for all that, it may have been noted before. W. W. B.

Providence, *March* 23.

§ 316. **New Jersey Plants.**—Last June I collected in waste ground at Communipaw, N. J., *Papaver dubium*, L., and, in cool, moist woods near Plainfield, *Aralia quinquefolia*, Gray. On looking over the latest edition of "Catalogus Plantarum in Nova Caesarea Repertarum" I do not find these two plants. They appear to be new to the State. FRANK TWEEDY.

Plainfield, N. J.

§ 317. **Publications.**—1. *Report upon United States Geographical Surveys West of the one hundreth Meridian, in charge of First Lieut. Geo. M. Wheeler, Corps of Engineers, U. S. Army: Vol. VI. Botany:* This volume consists of "Reports upon the botanical collections made in portions of Nevada, Utah, California, Colorado, New Mexico and Arizona, during they years 1871–5,", by Dr. J. T. Rothrock. Dr. Engelmann and Prof. Porter have contributed the account of the numerous orders to which they have given special attention; Mr. Watson, the Leguminosae; Mr. Bebb, the Willows; Dr. Vasey, the Grasses; Mr. Boot, the Carices; Prof. Eaton, the Ferns; Mr. James, the Mosses; and, finally, Prof. Tuckerman, the Lichens. Twenty-seven out of fifty new species, and ten old but rare ones have been beautifully figured in 30 plates by Sprague and Seaman, and engraved by Julius Bien, of New York City. For the convenience of those who may wish to consult these plates, we here give the list. 1. *Canotia holacantha.* 2. *Paryella filifolia* and *Petalostemon tenuifolius.* 3. *Horkelia purpurascens* and *Potentilla Wheeleri.* 4. *Petalonyx nitidus* and *Viguiera reticulata.* 5. *Brickellia longifolia.* 6. *Aplopappus cervinus.* 7. *Townsendia Rothrockii*, and *Aster Coloradoensis.* 8. *Actinomeris Wrightii.* 9. *Wyethia Arizonica.* 10. *Hemizonia Wheeleri.* 11. *Laphamia megalocephala.* 12. *Leucampyx Newberryi.* 13. *Artemisia Rothrockii.* 14. *Pyrrhopappus Rothrockii.* 15. *Chaetadelpha Wheeleri.* 16. *Palmerella debilis* var. *serrata.* 17. *Hedeoma hyssopifolia.* 18. *Nama Rothrockii.* 19. *Gilia debilis* and *G. demissa.* 20. *Convolvulus longipes.* 21. *Halenia Rothrockii.* 22. *Fraxinus coriacea.* 23. *Abronia villosa.* 24. *Atriplex Wolfii.* 25. *Urtica Breweri.* 26. *Sisyrhinchium Arizonicum.* 27. *Trisetum Wolfii, T. alpestre* and *Vilfa minima.* 28. *Poa Wheeleri.* 29. *Festuca Thurberi.* 30. *Notholaena Hookeri.*

The Catalogue is preceded by three short chapters of a more popular character, on the Colorado District, the New Mexican District, and Economic Botany. An appendix enumerates the plants collected in California in 1875. A good index completes the work. "As a rule, only the plants collected by the various parties of this Survey have been enumerated or described in this Report. In the masterly contribution on the Ferns alone has this rule been widely departed from." This last is Prof. Eaton's Ferns of the Southwest, a full report of all the Ferns discovered hitherto in the regions of the United States, lying west of the 105th degree of west longitude, and south of the 40th degree of north latitude. As all the species and genera not found in Gray's Manual, and even some of these are described in this report, it must be the standard reference at least till that magnificent work, the "Ferns of North America" is completed. Lieutenant Wheeler and Dr. Rothroch may well congratulate themselves on the excellent dress in which this report is presented; the paper, the type, the engravings are all worthy of the scientific ability expended on the subject matter.

We are tempted to arrange from the chapter on Arizona two contrasted pictures.

The Black Mesa is really an island of verdure raised up out of the more desert areas north and south of it. There the scene was one of transcendant floral wealth. The conifers towered up sometimes more than a hundred feet, but the oaks were seldom over 25 feet high, but branched out vigorously. The herbaceous vegetation was luxuriant beyond anything else seen in Arizona, and here only was the striking *Sisyrinchium Arizonicum* found. *Frasera speciosa*, *Onosmodium Thurberi*, and acres of *Aquilegia chrysantha* luxuriated on the hill-sides ; whilst in the cold spring water *Claytonia Chamissonis*, *Ranunculus hydrocharoides*, and *Habenaria leucostachys* were growing abundantly.

South of the Mogollon Mesa we begin the descent to the parched, superheated valley of the Gila River. Here hardness of texture and contraction of form are characteristic of the flora. The giant *Cereus* occupies the hill-sides which have a southern and southeastern exposure, towering up to height of from 30 to 50 feet. *Fouquiera* with its leafless, wand-like trunk, and its tip of scarlet flowers ; *Agave Palmeri* and *A. Parryi* ; and various species of *Dasylirion*, dry rigid skeletons of plants without the living green ; *Canotia*, a tree 20 feet high, a foot in diameter, with green branches provided with stomata, but no leaves, all go to complete this desolate floral landscape.

A curious omission in the Catalogue is that of Cereus giganteus, a grove of which forms the striking frontispiece of the volume.

We notice that Dr. Oscar Loew, a member of the Torrey Club, was a very efficient member of the expedition.

2. *Catalogue of the Davenport Herbarium of North American Ferns, Boston, Massachusetts*, GEORGE E. DAVENPORT, December, 1878. Price 50 cents. With names of donors and collectors, localities, geographical range, critical notes, and an appendix containing a list of all doubtful species, and those heretofore erroneously credited to this region. We presume that all the many amateurs and collectors of American Ferns have already possession of this incomparable catalogue. If not, we can assure them that they are much behindhand. For, while the special object in publishing it was to make the claims of the Davenport Herbarium upon the consideration of collectors more widely known, in order that the collection may be made still more complete, the critical notes are so important as to be indispensable to those who would discriminate wisely between the many variations of fern forms. In 1875, Mr. Davenport transferred his valuable collection of North American Ferns to the Massachusetts Horticultural Society, and has since been unwearied in perfecting it. Yet some of the rarer species are still imperfectly represented, and lack those essentials of good herbarium specimens, caudex and roots. These he is anxious to improve, and also to complete the collection as originally planned, by the addition of copious suites of specimens with caudex and roots, from widely different localities, so as to exhibit the plants in all stages of their development ; as it is only by a careful study and comparison of the specimens in such a collection that a correct knowledge of the different species can be obtained. Fuller suites of the Ferns of Texas, Arizona, and New Mexico, and also of the rarer species from California and Florida, are particularly desired

and such specimens are earnestly solicited. The readers of the Bulletin, we are sure, who have derived so much instruction from Mr. Davenport's notes, will feel it their duty to bear his wants in mind. He proposes now to add to the herbarium the remaining vascular Cryptogams of the United States, and offers to exchange these or ferns, if desired, whenever possible.

3. *Characeae Americanae, illustrated and described*, by Timothy F. Allen, M.D., etc., 10 East 36th Street, New York.

Part I. *Chara gymnopus*, A. Br., var. *elegans*, A. Br.: Part II. *Chara crinita*. Wallr., var. *Americana*. In the Bulletin, for March, 1871, (II. 9), Dr. Allen gave a list of 14 *Characeae*, and invited assistance. We are glad to see that he has not forgotten his favorite plants. The parts here published consist of one fine colored plate each, with a page of systematic description. They are to be issued monthly, and to include every species and variety known to American waters. The author offers to send the work to botanists in exchange for Characeae to the number of fifty specimens of each variety. The cover contains directions for collecting, which we copy, to facilitate his work. "These plants grow in fresh or brackish water, rooting in the earth on the bottom. Care should be taken to preserve the rooting parts, which sometimes bear peculiar bodies containing starch. Gather when in fruit; if dioecious, gather both sexes. The rigid forms may be dried like land plants, but the more delicate varieties should be floated on thin white paper; to this end a large mass may be carried home and single specimens selected; the paper and plant may be allowed to drain, after which the specimen must be covered with thin loose muslin and dried between layers of bibulous paper frequently changed, and subjected to very moderate pressure." Price for a single part, 25 cents; five parts for one dollar. Size, large quarto.

4. *Boston Society of Natural History. Guides for Science Teaching, No. II. Concerning a few Common Plants*, by George L. Goodale, 2nd edition, pp. 61. Boston, Published by the Society, 1879. This little book is not a manual of instruction in botany, but an exposition of the method used by Prof. Goodale, with extraordinary success in bringing into activity and directing the observing and reasoning powers of his class of 500 teachers. In the hands of a good botanist and very intelligent teacher it may be counted upon as one of the best contributions to scientific instruction and botanical investigation that this country has produced. The pupils instructed by Prof. Goodale may be expected, wherever they may be called upon to teach, to plant the seeds of a more vigorous scientific life. The key note of the whole is that "the teaching is not to be a 'pouring in' it is simply giving the thirsty a chance to drink." Though these lectures were given to teachers, the purpose was to show them how to teach children. That ordinary children can so be taught to their delight by a gifted teacher, eliciting surprising proofs of the native acuteness of their young intellects, has been shown by the results obtained in England by Prof. Henslow, and by Prof. Goodale and others in this country.

§ 318. **Florida Plants.**—We have had several applications for information where to purchase herbarium specimens of the rarer Southern plants, particularly ferns. Miss Mary C. Reynolds, St. Augustine, Florida, has recently sent us some nice specimens of *Nymphaea flava*, *Psilotum triquetrum*, *Polypodium Phyllitidis*, *P. aureum*, *P. pectinatum*, *P. Plumula*, *Adiantum tenerum*, *Vittaria lineata*, *&c.*, and informs us that she has these and other Southern plants to dispose of at very reasonable prices. Of Polypodium Phyllitidis she writes that her brother obtained from a locality on Indian River fronds from two to four feet long. They grew on the earth-laden spurs of a Live-oak which was *twenty feet* in circumference.

§ 319. **Cyperus cylindricus,** *Mariscus cylindricus*, Ell.—As long ago as 1866 a Cyperus was gathered near Tottenville, Staten Island, which seemed quite distinct from C. ovularis, Torr., chiefly in its smaller, more cylindrical heads. Mr. N. L. Britton has again collected this plant in the same spot, and on comparing it with the specimens in the Torrey Herbarium finds it most nearly corresponding with Elliott's Mariscus cylindricus. It may be that this plant has been gathered by others in some other spot. At all events, it is to be looked for this season. Mr. Britton or the editor would be thankful for specimens, if it should turn up any where else.

✓ **Note to § 309, Vitis.**—*V. cordifolia* flowered this year in the last week of May, about 4–6 days *before* Ailantus bloomed. Last year I stated that it flowered with the opening of Ailantus blossoms.

Vitis aestivalis is with us always the latest, and blooms some 4–6 days after *cordifolia* in the same localities. G. E.

Terms—One Dollar per annum beginning with the January number. For the Botanical Directory 40 *cents : three copies for one dollar, or twelve for three dollars. Vols. I.–V., with index, and photograph of Dr. Torrey,* $3.75. *Copies of Constitution and By-Laws of the Club.* 25 *cents. Address,* Wm. H. Leggett, 54, *East* 81*st Street, New York. Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money*

The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* Dr. Thurber *the President of the Club may be found at* 245 *Broadway.*

§ 320. **The Botanical Text Book, Sixth Edition.**[1] *Part I., Structural Botany, or Organography on the Basis of Morphology. To which is added the Principles of Taxonomy and Phytography, and a Glossary of Botanical Terms*, by Asa Gray, LL.D., &c. Ivison, Blakeman, Taylor & Co., New York and Chicago.—We think it must have been Gray's *Elements of Botany*, published about 1836, which gave us our first insight into the science. We well recall the delight with which we read the clear elucidation of the subject—delight in the method, for we had no particular experience in the matter. This clear method, the presentation of Structural Botany on the basis of Morphology, has been continued and improved upon in all the successive editions of the Text Book, the first of which was published in 1842, and the fifth so long ago as 1857. So great has been the growth of the science in the interim, that it has been found advisable to divide the sixth edition into four volumes, of which the present, on *The Structural and Morphological Botany of Phaenogamous Plants*, properly appears first, and will undoubtedly for years to come be the main text book on the science in our colleges and scientific schools, containing as it does the latest results in this department, treated with a mastery and a clearness of which we know no equal. The second volume, on *Physiological Botany* (*Vegetable Histology and Physiology*), is assigned to Prof. Goodale. The third volume, the *Introduction to Cryptogamic Botany, both Structural and Systematic*, will be the work of Prof. Farlow. A fourth volume, a *Sketch of the Natural Orders of Phaenogamous Plants, and of their special Morphology, Classification, Distribution, Products, &c.*, will be needed to complete the series; this we earnestly hope that Dr. Gray will live to accomplish. We may then learn his final views as to the vexed questions in the arrangement of the natural orders. At present he gives a general but decided recommendation to that of Bentham & Hooker. Of Dr. Gray's great services to the Science, a most significant one is that he has been able to gather about him, to share and carry on his work, men like Watson, Goodale and Farlow.

The present edition has been entirely re-written, and as there is no want of elementary works, this is intended to serve as a text book for the higher and complete instruction. The relegation of the physiology, &c., to the other parts has left room for the fuller treatment in this of those morphological points which in late years have received the greatest development. The volume contains 442 pp. against 555 in the 5th edition, and 314 against 350 in the chapters relating properly to structural botany. Dr. Gray's writings are noted for the proper and strict application of terms, of which many additional examples are here to be found. An interesting feature are the foot notes referring to the literature of the more important additions and often to the history of a technical term.

Of the eight chapters, Chap. V., on *Anthotaxy*, and Chap., VI., on the *Flower*, are the fullest of new and weighty matter, containing the discussion of the latest investigations, notably of Eichler in his

1- See p. 328.

Blüthendiagramme. The account of the various kinds of inflorescence in Chap. V. elucidates a very difficult subject. In the doctrine of the flower, Chap. VI., it is stated that "extended observation leads to the conclusion that the typical flower in nature has two series in the perianth, or is *Diplosteminous*, the stamen circles alternating respectively with calyx and corolla. The terms *Antisepalous* and *Antipetalous* proposed for such stamens are so much better than *episepalous* and *epipetalous* that we may reasonably look for their general adoption. This chapter is full of interesting discussions of different points in floral irregularity, and of the adaptations for fertilization.

Chapter IX., *Taxonomy*, treats first of the vegetable individual and secondly of the idea of species. In regard to the former, the conclusion is: "Upon the view here adopted, that plants do not rise high enough in the scale of being to reach true individuality, the question is not whether it is the cell, the phytomer, the shoot, the tree, or the whole vegetative product of a seed which answers to the animal individual, but only which is most analogous to it. In our view, its analogue is the cell in the lowest grades of vegetable life, the phytomer [plant part=node] in the higher. But, in botanical description and classification, by the individual is meant the herb, shrub, or tree, unless otherwise specified."

As the elusive idea of species underlies the whole question of classification and evolution, we shall endeavor to present Dr. Gray's views, though probably our disconnected quotation may fail to do him justice. He says: "Among the many definitions, that of A. L. Jussieu is one of the briefest and best, since it expresses the fundamental conception of a species, *i. e.*, the perennial succession of similar individuals perpetuated by generation." "The two elements of species are: 1. Community of origin; and 2. Similarity of the component individuals. But the degree of similarity is variable, and the fact of genetic relationship can seldom be established by observation or historical evidence. It is from the likeness that the naturalist ordinarily decides that such and such individuals belong to one species. Still the likeness is a consequence of the genetic relationship; so that the latter is the real foundation of species." p. 317. Speaking of Subspecies: "We judge them not to be so many species, either, because in the case of cultivated races we know something of their origin or history, and more of the grave changes which long domestication may bring to pass; or because the forms, however stable, differ among themselves less than recognized species generally do; or because very striking differences in the extremes are connected by intermediate forms. And our conclusions, it must be understood, are not facts, but judgments, and largely fallible judgments. For while some varieties appear strikingly different, some species are very much alike." p. 320. Referring to the remarkable reversion of the hybrids of Datura: "There appears, therefore, to be a real ground in nature for species, notwithstanding the difficulty and impossibility in many cases of defining and limiting them." p. 322. "All plants of the same species are so much alike that they are inferred to have descended from a common stock, and their differences, however grave, are supposed to have arisen from subsequent variation, and the more marked differences to have become fixed through *heredity. This is included in the idea of species.* Descent from a common stock explains the likeness, and is the only explanation of it," p. 328, the italics are ours. "Doubtless if variation, such as botanists have to recognize within the species, be assumed as equally or even more operative through long antecedent periods, this would account for the diversification of an original species of a genus into several or many forms as different as those which we recognize as species. But this would not account for the limitation of species, which is the usual (but not universal) characteristic, and is *an essential part of the idea of species*," ibid. We find here some obscurity; the italics again are ours. Just this is accounted for by the *Survival of the Fittest* in the *Struggle for Life*. "Thus an ancestral type would become diversified into races and species. Earlier variation under terrestrial changes and vicissitudes, prolonged and various in geological times since the appearance of the main types of vegetation, and the attendant extinctions, are held to account for genera, tribes, orders, &c., and to explain their actual affinities. Affinity under this view is consanguinity; and classification, so far as it is natural, expresses real relationship. Classes, Orders, Tribes, &c., are the earlier or main and successful branches of the genealogical tree, genera are later branches, *species the latest definitely developed ramifications, varieties the developing buds*." p. 329. The italics ours. Add to this the note on page 319, where, differing from Darwin, Dr. Gray says: "Naegeli, Brown and myself incline to the opinion that each plant has an inherent tendency to variation in certain general directions," and we have a tolerably complete presentation of his views on this subject.

The logician sometimes complains, when he finds, on analyzing a plant, that the description differs somewhat from the specimen before him. We have so often met with these objections, that we are glad to put the answer in Dr. Gray's words, which are apposite for this purpose, though having a more general intention. "The naturalist's groups, of whatever grade, are not *realities*, but ideas. Their consideration involves questions, not of *things*, between which absolute distinction might be drawn, but of *degrees of resemblance*, which may be expected to present infinite gradations."

After discussing these questions, the chapter gives a particular account of the Linnaean classification, and a more general one of the Ante-Linnaean, and of the more noted Natural Systems.

Chap. X., *Phytography*, gives rules for the description and naming of plants. Then follow directions for the collection, preservation, and examination of specimens. This may be called the Practical Chapter of the book, and will prove one of the most interesting to the working botanist. We have never met with so complete information on all points which a student who wishes to study, describe, or preserve his specimens, or to correspond with other botanists, wants to know about. To the section on Herborization Mr. Hoysradt contributes an abstract or new edition of his valuable notes, which have from time to time appeared in the BULLETIN. At the close, the chapter treats of herbarium cases, with a recommendation of the small and inexpensive cabinets proposed and illustrated by Dr. Parry in the American Naturalist, VIII, 471.

We have next a much needed table of the usual abbreviations of the names of botanists and botanical authors, and of the other abbreviations and signs used in botanical works.

Finally, the Glossary or Dictionary of botanical terms, English and Latin, is much enlarged. We find here, for example, the adjective "*brunneus*, deep brown," for which we have searched the Latin lexicon in vain. The Index part is a reference, at the end of a definition, to the page where the term has been introduced. Nevertheless, we feel the want of a separate index, for the attempt to combine the two is apt to lead to oversights and omissions; vide *polembryony* or *polyembryony*, for an oversight, and *antidromy*, for an omission, perhaps intentional, but the word as it is used, p. 157, it is entitled to a place in the glossary.

The generally excellent illustrations have been retained as far as possible, perhaps unnecessarily so in Fig. 221, and many new ones have been added. We have noticed but few typographical errors, such as are common to a first impression of a text book, and these chiefly in the numbers referring to the figures. On page 281, Fig. 576, 578 occur repeatedly for Fig. 579, 581.

There are several expresssions in the course of the volume implying the author's satisfaction or dissatisfaction with his formerly published views, which will be regarded with peculiar interest by those who have long regarded Dr. Gray as their great teacher and model.

In the Utica *Morning Herald*, of June 26th, is published the *Plant Exiles*, the annual poem read before the Society of Hamilton Alumni, by Benjamin D. Gilbert, of Utica—a pleasing tribute to the illustrious botanist who

"——sprang from the hills that rise in the midst of Oneida."
"—— the teacher whose genius translated the tale of the Glaciers,
Read in the levaes of the plants the runes that within them lay."

§ 321. **Notes from Prof. I. H. Hall.**— A few days since, on a short trip to Western New York, I visited some familiar localities to see how things were growing, and noticed that the thinning out of some damp woods had greatly increased the number of seedlings of Sanguinaria. I presume that others, like myself, have often seen seedlings of this plant, and noticed how the very young leaves are almost always round-reniform. I have had this plant in cultivation, to which it takes very kindly, and in so doing becomes highly ornamental; and I have noticed that it readily multiplies from the seed. It is worth extended domestication; and it does not depend very much upon shade for thriftiness.

I also saw that the Onoclea in several localities was very much given to sporting; that is, to putting forth fronds that were midway between the shapes of the sterile and fertile normal shapes; and of course all the erratic forms were more or less fertile, as far as could be inferred from the present green stage. No one who is accustomed to observing this fern is in much danger of mistaking the half-unfolded sterile fronds for sports. Along the upper Hudson river, it seems to me that the immense beds of Orontium are rather increasing than diminishing.

Western New York explorers know well how many springs in the region of the parallel lakes boil suddenly up from a hole in the rock, with water of the coldest and clearest; and how the stream thus formed almost invariably fills with thriftiest edible water cress. Seeing some such phenomena again a few days since reminds me of one almost exactly the same in the island of Cyprus. While travelling about the island with General di Cesnola, we came to a beautiful grass plat (an uncommon thing in the East) not far from the ruins of Soli, along the shore. About a dozen such springs boiled out of the ground, and furnished not only life to this grass-plot, but each sent its rapid stream through it or along its edge, when all joined and rushed into the sea, over a bar of quicksand that nearly swallowed up one of our men and mules. In each of the streamlets, and in the main stream as well, was an abundance of thrifty water cress, identical in species with that so commonly eaten in the oyster saloons in New York City. I never saw it elsewhere in Cyprus. At my suggestion, a quantity was gathered for our supper, and eaten by all with great relish, though I had to separate it carefully from a little poisonous umbellifer, whose name I have forgotten, and which grew in the midst of the cress and much resembled it. I might add that the only mention of this place of springs to be found in earlier writers was made somewhat more than a century ago by an ecclesiastic, who describes the place unmistakably, but mistakenly speaks of the springs as hot and medicinal.

One more note will do. As Mr. Redfield can inform you, the Philadelphia markets are an excellent locality for botanists who wish to get fresh specimens, in proper season, of most of the pretty plants of the New Jersey Pines. This spring large quantities of the wild Viola tricolor were brought in, but I could not learn their precise habitat.

June 18th. I. H. HALL.

§ 322. **A New Theory in regard to Galls.**—Insect galls, which are usually regarded as excrescences—a diseased condition of vegetable tissue, resulting from the injection of some fluid or secretion by insects—are viewed by Mr. A. S. Wilson, of Aberdeen, from an entirely different standpoint. This gentleman, in an interesting communication to *Nature*, says that all insect galls are in reality leaf-buds, or fruit-buds, and not mere amorphous excrescences. The vascular lines which would form leaves can easily be followed up the structure of the oak-leaf galls. And in cases where the egg has been deposited in the tissue of a young branch, the cap of the gall is sometimes surmounted by a leaf two or three inches long. But in the large blue Turkish galls many lacunæ occur where the fleshified leaves have not filled up the spaces between them. Mr. Wilson promises before long to work out the morphology of the hollow woody shell, and the enclosed starch, etc., found in the interior of these galls. He states that if a dissection be made of one of the weevil galls on the bulb of the turnip, the second or third slice will show the outer foliations, exactly similar to those of the root buds. When the centre has been reached, where the maggot will be found, there will also be found a vascular pencil running up from a medullary ray in the bulb, and bearing on its top a bud of the same description as that produced by a ray running out from a root. The insertion of the insect's ovipositor brings a medullary ray into action, producing a tuberculated bud, and it is only the bud which the larva feeds upon. The author thinks the growth of a bud is an intelligible cause of the growth of a gall, but that we can infer nothing from the injection of a fluid. These statements seem to merit further examination, for if "oak-spangles," button-galls, and a host of like productions are really leaf-buds, they are certainly developed in very abnormal situations.

§ 323. **Washingtonia.**—The name *Washingtonia*, which was proposed by Kellogg to displace Lindley's *Wellingtonia*, and both of which had to give way before Endlicher's *Sequoia*, is now proposed for a Palm which has hitherto been referred to two different genera. This Palm, first known as *Brahea filifera* and then as *Pritchardia filifera*, is believed by Mr. Hermann Wendland (*Botanische Zeitung*), to possess sufficient differences to constitute it a species of a genus different from that of *Pritchardia*, and which he would name, as above stated, *Washingtonia*.

§ 324. **Peteris aquilina,** *var.* **caudata** is frequent in Southern New Jersey and Delaware.

Cyperus ovularis, *var.* **cylindricus** (*Mariscus cylindricus*, Ell.), is the prevailing form in Southern New Jersey and southward throughout the Delaware peninsula. WM. M. CANBY.

§ 325. **Notes from New Jersey.**—On Saturday I noticed some very large trees of *Sassafras* on the road from West Orange to Livingston. I measured the largest one and found it three feet in diameter three feet above the ground, towards which it increased rapidly in size.

The following plants have recently been found in Franklin: *Floerkea proserpinacoides*, Willd.; a double and rose-tinted variety of *Rubus villosus*, Ait.; *Pogonia verticillata*, Nutt.; *Conopholis Americana*, Wallroth; *Medicago maculata*, Willd.; and a dwarf variety of *Azalea viscosa*, L. [var. *nitida?*]. Of this variety I found no specimen over a foot high, but the flowers were larger than any I have ever seen in the typical form. In Bloomfield: *Nasturtium sylvestre*, R Br., and *Leucothoe racemosa*, Gray. In Montclair: *Obolaria Virginica*, L.; *Cypripedium parviflorum*, Salisb.; *Monotropa Hypopitys*, L., and *Silene inflata*, Smith.

The *North Jersey Botanical Club* was formed on May 7th, and has already resulted in the introduction of the study into several schools. *President*, H. H. Rusby; *Secretary and Treasurer*, Miss Grace E. Cooley, Bloomfield; *Executive Committee*, Charles M.

Davis, Bloomfield; Miss J. Randall Spaulding, and Miss —— Eldridge, Montclair.

FRANKLIN, N. J., *June 9th.* H. H. RUSBY.

§ 326. **White Strawberry.**—I send you some plants of a white strawberry. It is plainly *Fragaria vesca*, L. These plants have borne white fruit as long as I have known anything about them, so that the peculiarity seems to be constant. On referring to the BULLETIN (II. 30), I find that this has been noticed by Mrs. A. E. Brown, in Northern New York. She found the whole plant of a lighter color than those which had red fruit. My specimens having only the fruit white might perhaps be called *var.* albocarpa. The plants grow in the shade and perhaps this may be connected with the color of the fruit.

Staten Island Plants.—Please add to my list of Staten Island grasses, *Agrostis alba*, L., common ; *Calamagrostis Canadensis*, Beauv., near Garretsons ; *Glyceria obtusa*, Trin., near Tottenville. *Arrhenatherum avenaceum*, Beauv., near Clifton, and at Richmond village. I have also found *Monarda fistulosa*, L., at Richmond, and *Trifolium incarnatum*, L., in waste ground near Richmond.

Cyperus.—I am studying this genus, and wish specimens from all quarters. Would be glad to exchange.

NEW DORP, *July 2d.* N. L. BRITTON.

327. **Notes from Rhode Island.**—I found the other day in peculiarly rich and moist soil a gigantic fasciated specimen of *Ranunculus repens*, L. As Dr. Masters does not record this plant among his instances of fasciation, it may be worth noting. On the same day I found growing on newly filled in land a vigorous patch of the rare weed, *Anthemis arvenis*, L. [Common about New York, EDS.]

PROVIDENCE, *June 17th.* W. W. BAILEY.

§ 328. **Lythrum Salicaria,** L.—This plant so interesting on account of its strongly marked trimorphous flowers, was found in abundance on July 5th, in meadow on south side of Moodna Creek, at its confluence with the Hudson River. It also occurs sparingly southward along the river road to Cornwall landing, just along the high water mark.

Echium vulgare, L., infests the roadsides and river banks in Cornwall and adjacent villages.

W. H. RUDKIN.

§ 329. **Antiquity of Orchids.**—In *Nature*, Ap. 3d, in a notice of Grant's *Origin and Devĕlopment of the Color Sense*, Mr. Wallace says of Orchids : " If we take into account the world-wide distribution of these plants, their immense richness in genera and species, and their wonderful complexity of structure, we must consider them as among the most ancient instead of among the most recent of flowers." In *Nature*, May 15th, *D. Wetterhan* writes in support of this view: " Out of fifty species of orchids" in Garcke's German Flora, " not less than forty-one occur in the British Isles" besides two not found in Germany "a proportion considerably exceeding that of phanerogams generally. Now as it seems scarcely credible that orchids should possess means of transportation across the sea in preference to other plants, we must conclude that they inhabited the British Isles before their separation from the Continent, which involves that they have occupied stations near the present coasts of Germany or France previous to a great deal of plants that reached these coasts only subsequently to the formation of the Channel." He also adduces the fact that the British orchids belong to very different groups of the order, enhancing the argument for antiquity based on their geographical distribution.

§ 330. **Bud Variation in Bananas.**—Fritz Miller writes (*Nature*, June 12): "In my garden there is a large plant (planted about eleven years ago) of a variety of banana, distinguished by purplish stems and petioles, red fruits, and by a very peculiar flavor of the latter. From the centre of this plant, covered by the rotten stems of former years, there are now growing green stems, with green petioles; one of them has already produced fruits, which were green when immature, and yellow when ripe, and the flavor of which I found to be but slightly altered. All the young stems growing from the circumference of the plant are purplish. May not many of the varieties of bananas have been produced by bud variation?"

§ 332. **Plantago Patagonica,** Jacq. *var.* **aristata,** Gray.—The Rev. S. W. Knipe, of Delaware Water Gap, Pa., found this plant in Southern New Jersey, June 28th. He says: "I saw but one locality, that by the side of the road leading south along the west bank of Maurice River, about a half mile below Millville, Cumberland Co., N. J. The plant was abundant for a distance of a rod or two, and is no doubt well established there." This is a very interesting discovery, the nearest station that we have heard of being Illinois.

§ 333. **Antidromy.**—Prof. W. W. Bailey, in the June No. of the *Botanical Gazette* describes the alternation in the convolution of the flowers on the same branch of *Mahernia verticillata*, L. A similar case is that of *Lechea*, and probably other Cistaceae. But in this order, as is well known "the petals are convolute in the opposite direction from the calyx in the bud." What is not so well known is that in Lechea the calices of the different flowers on the same branch alternate in the direction of their convolution, so that we have in this case a double antidromy, that of petals compared with calyx, and that of calyx compared with calyx, or flower with flower. The term *antidromy* is thus explained by Dr. Gray in the new edition of his text book, p. 157: "The phyllotaxy of each successive axis of the sympode changes from right to left and from left to right alternately." By *sympodium* is meant "a stem made of a series of superposed branches in a way to imitate a simple axis."

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*. 25 *cents. Address*, WM. H. LEGGETT, 54, *East* 81*st Street, New York.* *Money Orders on* Station K, *N. Y. All subscriptions or orders filled only on receipt of the money*

The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club may be found at* 245 *Broadway*.

BULLETIN OF THE TORREY BOTANICAL CLUB.
Vol. VI., Nos. 55 & 56.] [New York, July & Aug. 1879.

§ 334. **Death of Mr. Ruger.**—It is with profound sorrow that we record the loss by the Club of one of its earliest and most beloved members, Mr. M. Ruger, who died of dropsy of the heart, at his home in this city, on the 22nd of July, in the 44th year of his age. Only two days previously he had been out collecting plants; in returning he was obliged to leave the car by a sudden attack of illness, and fell before he could reach a drug store where he sought relief. After partial recovery he was helped home, but sank rapidly, suffering from short and difficult breathing, with increasing exhaustion, until his death. During the past two years he had had similar, but less violent, attacks, from which he seemed to have measurably recovered; but any considerable bodily effort was attended with a recurrence of the same symptoms. He was thus prevented from joining during the last two seasons in the long, field-day excursions of the Club, in which he had previously been the accustomed leader, and was confined to short and easy rambles near the city. Though thus forewarned, none apprehended so sudden an end, and to the members of the Club, to whom his botanical acquirements and personal traits had so warmly endeared him, the announcement of his death came like a shock.

The funeral services were held at the Eleventh Street Methodist Episcopal Church, of which from its organization he had been an active and valued. member, and were attended by those of the Club to whom notices could be sent. Some wreaths and sprays of leaves and wild flowers from the woods he so much loved, which one of the members had placed upon the casket, seemed to us to be more appreciative and appropriate emblems of the simplicity, the unaffectedness and the truth to nature which specially characterized our departed brother, than the beautiful but more pretentious and conventional floral tributes of harp and crown which also surrounded his bier.

Four addresses by clergymen and others attested to the high appreciation in which he was held in his relations to the church and Sunday school, where, besides other duties, he was musical director, instructor and composer. From the church his remains were taken for burial to the Cypress Hill Cemetery.

Mr. Ruger was of Dutch descent, and one of the numerous heirs of Annecke Jans, famed in the Trinity Church litigation. He was of so delicate a constitution, that, though his parents were in humble circumstances, he was never put to any employment, and he never attended school. His only instruction was received at home. But he was endowed by nature with a thirst for knowledge, an active intellect, quick and exact observation, a sound judgment and a retentive memory. Aided by these gifts, in the almost utter absence of the ordinary means of acquiring knowledge, he extracted, as by alchemy, from the slenderest materials and in the most adverse circumstances, the elements of a liberal education. He was a fair Latin scholar, had some acquaintance with several of the modern languages, was a good draughtsman, a composer of church hymns and tunes, and an instructor in musical harmony; and there was hardly any branch of natural science in which he was not sufficiently well read to be an intelligent auditor or critic. His specialties were the higher plants, fungi, and insects, of all which he had made considerable collections.

In personal qualities Mr. Ruger exhibited a rare union of "sweetness and light." He was as simple and unaffected as nature herself, and a stranger to envy and malice. No one ever knew him to utter an unkind word or an uncharitable judgment. He was generous and sympathetic; and he loved to impart his knowledge to others, and to share with them his botanical treasures. These kindly and noble qualities specially endeared him to the members of the Torrey Botanical Club, of which he had been long an officer, and of which he was one of the most constant, devoted and zealous members. He was for years the chief organizer and leader of its excursions in the field, and was always ready with hand and brain to serve in its interests. One of his last acts was the gift of nearly a hundred species to its Herbarium, and within a few days of his death he also mounted some specimens for its use.

It was the same warm and generous sympathy directed towards the young, the poor and the unprotected of the region in which he lived, that gave him so deep an interest in the Sunday school mission work of the church with which he was connected, and to which for many years he rendered constant and valuable service. From the same kindly nature also he had long been accustomed to prepare and to dispense without charge vegetable medicines to the poor about him, so that he had come to be commonly known and addressed in his neighborhood as Dr. or Prof. Ruger,—a title, however, which he never acknowledged or allowed himself to use. And at the time of his death he had prepared a considerable part of the sheets of a work on the Botany of our medicinal plants, and their properties, with drawings, designed for publication.

As a botanist, Mr. Ruger excelled in a familiar and exact knowledge of our native Flora. He had himself gathered almost everything that grows in our fields and woods, especially in the western part of Long Island; and to his observations the BULLETIN is much indebted in its early notes and local catalogue. He also exchanged extensively with botanists throughout the country, and was so careful and just in his returns that exchanges with him were widely sought and continued.

Through the practical and extensive knowledge of plants thus acquired, and an extraordinary memory, which seemed never to forget a plant once seen and known, he became the "walking encyclopædia" of the Club, and was scarcely ever at fault in naming at a glance any of the ordinary species east of the Mississippi, besides being largely acquainted with the more western species.

His love of plants was genuine and impartial. He found interest in everything that grows. The homeliest weed was to him never "vile"—an epithet which unworthily, as it seems to us, but not unfrequently, is applied in Gray's Manual to many of our humbler floral denizens; and the advent of Amarantus crispus or Chenopodium Vulvaria was greeted by him with almost as much apparent interest as the discovery of a new orchid would have been.

His universal and ardent interest in all flowering forms, as well as his extensive knowledge and the sympathetic communication of it were such as to enkindle in others a similar interest and zeal; and for the loss of men possessing this inspiring quality science will always grieve. As he was fond of referring to, and quoting the sayings of his great teacher, the lamented Dr. Torrey, no little of whose spirit and influence he caught and transmitted, so also will many of the younger members of the Club, to whom Dr. Torrey is personally unknown, find in the memory and example of Mr. Ruger a similar incentive and inspiration. A. B.

§ 335. **Trapa natans.**—A living specimen of this curious and interesting aquatic plant has been recently sent us by Dr. Allen, taken, we believe, by Dr. Paine from a pond near Concord, Mass. Prof. Sargent states that it is getting common in the ponds and stagnant waters about Cambridge, and threatens to become a nuisance. As it has not until recently been found in English or American waters, it is not described in any of the English or American manuals, and some account of it may be found useful.

The plant is common in the warm and temperate parts of Europe and Asia. It is common in the ponds about Versailles, but is said never to have been naturalized in England. By European botanists it has been usually classed with the Onagraceae. Its affinity, however, is rather with the Halorageae, from which it differs chiefly in its hemispherical stigma and ex-albumninous embryo. In the General Botany of Le Maout and De Caisne the Trapeae are made a distinct order, with but a single genus, Trapa; and the species *natans* is there figured with the fulness and beauty of anatomical detail which characterize that work.

"The name of 'Trapa,' says Paxton, is abridged from *calcitrapa*, the Latin name of an instrument called caltrop, (the Roman tribulus) furnished with four spines, formerly used in war to impede the progress of cavalry, the fruit of some of the species of Trapa being furnished with four spines. The same author mentions four species, *bicornis*, *bispinosa*, *quadrispinosa* and *natans*; all, except the last, found only in China and the East Indies. The large seeds of T. *bispinosa* are sweet and edible: they form an extensive article of cultivation. In Cashmere and other parts of the East they are common food and known under the name of Singhara nuts.

Trapa natans roots in the mud of stagnant or slow waters. The submerged stem rises to the surface, and of course varies in length with the depth of the water; the specimen sent us was about four feet long, thickly beset with leaves mostly opposite, pectinately dissected, and having the appearance of rootlets. The stem ends at the surface of the water, where it sends forth a thick and spreading rosette of leaves, which is often a foot in diameter, floating just above the surface. The leaves have stout, spongy petioles from two to six inches long, with the blade coriaceous and rhomboidal, or lozenge-shaped, from a half inch to an inch and a half long, with a breadth somewhat greater, the base entire, the upper edges coarsely dentate, smooth and shining above and strongly ribbed beneath. A conspicuous feature, sufficient to identify the plant at a glance, is the inflation at the middle of each petiole, forming a sort of elliptical bladder, which on the larger leaves is an inch long by half an inch in diameter. The bladders are entirely closed, not hollow, but of the same cellular, spongy texture as the petiole, and we suppose their purpose must be to assist in sustaining above the water the somewhat heavy clustered foliage. They form in fact a cordon of *life-preservers* about the central flowering parts.

The flowers (June–July) are solitary, short-peduncled, axillary, small and white; petals, calyx lobes and stamens, four, the latter inserted with the petals on a disk crowning the ovary; stigma, one, capitate; ovary semi-inferior, embraced by the adnate calyx tube, which rapidly enlarges in fruit to a turbinate, bony nut, nearly two inches long, one-celled and one-seeded from arrest; and from the calyx lobes are developed four sharp, spreading horns or spines, somewhat recurved, and often one-third of an inch long. The seed is mealy and edible, resembling the chestnut.

From the nut the plant is in Germany popularly called Schwimmende Wassernuss—Swimming Water-nut—which is so apt that it might well bear here the same popular name, rather than that of the "European Water Caltrop" by which it has been sometimes called. However introduced, it bids fair to stay, and its gradual extension southwards may be looked for. A. B.

§ 336. **Gray's Botanical Text Book.**—In our notice of this work in the June No. there were some obvious typographical errors, p. 318, l. 4, "Diplosteminous" for Diplostemonous; p. 319, about the middle "Brown" for Braun; and on p. 320, last line but one of third paragraph, "it is entitled" where "it" should be omitted, and also the comma after "views," in the next paragraph but one; and in the final line for "levaes" read leaves. But the chief error was the omission of some words in a sentence near the beginning of page 318. The sentence should read: In the doctrine of the flower, Chap. VI., it is stated that "extended observation leads to the conclusion that the typical flower in nature has two series of stamens, as it has two series in the perianth," or is *Diplostemonous*, the stamen circles alternating respectively with calyx and corolla.

The more we read this admirable work, the more we are impressed with its depth and its clearness. We embrace this opportunity to add the following exposition of the place of species in classification, as, perhaps, a necessary complement to our notice.

"Species is taken as the unit in zoological and botanical classification." . . . "The aim of systematic natural history is to express their [species] relationship to each other. The whole ground in nature for the classification of species is the obvious fact that species resemble or differ from each other unequally and in extremely various degrees. If this were not so, if related species differed from one another by a constant quantity, so that, when arranged according to their resemblances, the first differed from the second about as much as the second from the third, and the third from the fourth, and so on,—or if the species blended as do the colors of the rainbow,

—then, with all the diversity in the vegetable kingdom there actually is, there could be no natural foundation for their classification. The multitude of species would render it necessary to classify them, but the classification would be wholly artificial and arbitrary. The actual constitution of the vegetable kingdom, however, as appears from observation, is that some species resemble each other very closely indeed, others differ as widely as possible, and between these the most numerous and the most various grades of resemblance or difference are presented, but always with a manifest tendency to compose groups or associations of resembling species,—groups the more numerous and apparently the less definite in proportion to the number and the nearness of points of resemblance. These various associations the naturalist endeavors to express, as far as is necessary or practicable, by a series of generalizations, the lower or particular included in the higher or more comprehensive." pp. 322–323.

§ 337. **Polemonium cæruleum, L.**—A new locality is worth recording of this species, for which the recently published volume of the synoptical Flora of N. A. states but four localities east of the Rocky Mountains. I have met with it in three spots on the elevated (2600–2700 ft.), open glades around Oakland, Garrett Co., Md.

Growing in deep beds of *Sphagnum cymbifolium* and *S. acutifolium*, the stout, branching rhizomes develop numerous villous roots, and large (12–17 inches) leaves. The stems, single or in pairs, attain sometimes the height of 44 inches, overtopping the surrounding sedges (*Eriophorum Virginicum*, *Rhynchospora alba*, *Carex stricta*, *&c.*) Leaves diminishing to pinnate and simple bracts, leaflets, 7–21, ovate, lanceolate; inflorescence a narrow cymose panicle, composed of corymbose clusters terminating the main stem and the short erect branches (not a thyrsus in the strict sense of that term, as defined by recent writers, the order of development being centrifugal in respect to the primary branches as well as the ultimate clusters); flowers erect, calyx-segments longer than tube of corolla, with spreading tips; seeds 5–21, unequally divided among the cells, usually 4–6 in each, one or two often widely wing-angled and abortive; flowering from last week in June to August.

Our other species, *Polemonium reptans*, L., is also found around Oakland, but in drier and more shaded places on the mountain-sides, and flowers about a month earlier.

JOHN DONNELL SMITH.

§ 338. **An Orchid new to America.**—*Epipactis Helleborine*, var. *viridans*, Irm. (*E. viridiflora*, Reichenb.) as determined by Dr. Gray, was found in the vicinity of Syracuse by Mrs. M. P. Church of the Syracuse Botanical Club, on the 6th of August, during the weekly expedition of the Club to the woods. Mrs. M. O. Rust has kindly sent us specimens. The stem is leafy but no root leaves were found. The roots were fleshy and fascicled. Mrs. Rust writes: "I should judge that there could be no doubt as to the plant's being indigenous. Its home is right in the woods, the nearest habitation being a small farm-house. It does not grow over any great territory; I should think not more than a hundred feet square. It is on a hill under beeches, elms, maples and a few pines. In the valley near it I found, for the first time, *Pogonia pendula*, Lindl."

No plants are so eagerly sought for as orchids. Yet Epipactis, all these centuries, has shut itself up, waiting for the sharp eyes of the ladies of the Syracuse Botanical Club. What new discoveries are to be expected from their penetrating glances. *Place aux dames.*

§ 339. **Syracuse Botanical Club.**—We noticed the formation of this Club in our January No., under the name of the *Rust Botanical Club.* Their president, however, protested against the eponym, and it was accordingly changed. The resident members are exclusively ladies, about thirty-two in number Their discoveries of Botrychium Lunaria, Epipactis, &c., and their list of the *Filices Onondagenses*, comprising about fifty distinct varieties, some very rare, prove them to be among the most active of botanists. The president assigns to each member some family of plants to study up. They have field-meetings twice a week in the season, a weekly meeting for study, and a business meeting on the third Monday of each month. This organization is admirable, and might be profitably imitated, where practicable.

The officers are: *President*, Mrs. S. M. Rust; *Vice-President*, Mrs. Chas. Barnes; *Treasurer*, Mrs. A. D. Fairbanks; *Secretary*, Mrs. M. J. Myers. Among the corresponding members are Profs. Gray, Eaton, Peck and Robinson. Should they ever require a seal, Epipactis and Botrychium Lunaria suggest an appropriate device.

§ 340. **Plantago Patagonica,** Jacq., var. **aristata,** Gray.—Since this plant has been found in Southern New Jersey, you may like to know that one specimen of the same was found last fall at Long Hill, on the edge of this city, by Mrs. A. V. Burnham. In the spring of this year she looked for it again, and found it growing abundantly. The locality is near a place where the horses used at a brick-kiln close by are fed, and, if western grain is used, that may account for the appearance of this western weed. I enclose a small specimen; I have others eleven inches high with a dozen mature spikes, and some of the plants were too large for herbarium sheets.

Nantucket plants.—A few interesting plants have been found this summer in Nantucket, Mass., farther north on the coast than they have been noticed before. Ascyrum Crux-Andreæ, L., Hypericum adpressum, Barton, which is very abundant near some of the ponds, and Utricularia subulata, L., in two localities.

These discoveries are due to the zeal of a botanical society formed there about a year ago, whose members are beginning to collect for a complete herbarium of the Island flora.

To this list of southern plants we can add Baccharis halimifolia, L.; Erythraea spicata, Pers.; a variety of Sabbatia stellaris, Pursh, and Opuntia Rafinesquii, Engelm., which have long been known on the Island. Plants much like Opuntia vulgaris, Mills, are also found there, but it will take another summer to decide the species positively.

MARIA L. OWEN.

SPRINGFIELD, MASS., *Aug.* 19*th*, 1879.

§ 341. **Botrychium Lunaria,** Sw.—This summer there has been a new station discovered for Botrychium Lunaria by Miss Laura Geddes. As it is some ten miles from the one I discovered on the Janesville road, June 17th, 1872, and there has never been any of it found in intermediate localities, we feel much delighted with the young lady's good fortune. We think it wiser not to give the exact habitat, as it is getting uprooted from the old one. Many of the specimens from Miss Geddes' station have the segments placed more closely together than in those I found, looking more like my Labrador specimen: some, too, have the margins much incised. Why we do not find Botrychium boreale remains a mystery, but we still hope to place it in our Onondaga Flora.

MARY OLIVIA RUST.

SYRACUSE, N. Y., *Aug. 22nd.*

§ 342. **Habenaria peramœna,** Gray.—A single specimen of this handsome orchid has been brought to me from near Haddonfield, New Jersey. I have no knowledge of its having been detected in this part of the State before, and think it worthy of note.

The introduction of foreign plants in ballast deposits, both here and at Philadelphia, still continues. I have collected more new arrivals this year than for some time past. They are chiefly of species from Southern Europe, some from the African coast, and occasionally some from the West Indies and South America.

ISAAC C. MARTINDALE.

CAMDEN, N. J., *Aug.* 18.

§ 343. **Aspidium aculeatum,** Sw., var. **Braunii,** Koch.—New localities of this fern are being reported from time to time. In addition to the two in the Catskill mountains already known we have now another in the Bushnellsville Clove, sometimes called "Deep Hollow," on the road from Shandaken to Westkill, where it was collected on the 15th of August by Misses Mary and Caroline Redfield, of Pittsfield, Mass. This deep, rocky gorge, shut in by mountain walls, has the conditions under which this fern is usually found, and lies far back in the Catskills, on the boundary between Ulster and Greene counties, and not far from the border of Delaware Co., N. Y. The height of the clove is 1973 feet.

J. H. R.

§ 344. Notes of a Botanical Excursion into North Carolina.

The recent re-discovery of *Shortia* in North Carolina has created much interest among botanists. Dr. Gray, who first called attention to Michaux's original specimen and established the genus upon it, had long ago indicated the probability of finding it anew. Searches repeated in the course of many years had proved fruitless, so that to the botanical fraternity and particularly to the author of the genus the recovery was somewhat like that of a long-lost child. Desirous to see the plant *in situ*, he accepted the kind offer of Mr. M. E. Hyams to guide him to the spot, and two comrades of a former excursion, Messrs. Canby of Wilmington and Redfield of Philadelphia, with another who was new to the region, Prof. C. S. Sargent of Boston, Director of the Arnold Arboretum, were included in the invitation. The object was not only to see *Shortia*, but to find more of it if possible, and to explore some portions of the mountains which the oldest member of the party had visited in 1841 and 1843. Moreover, the hurried autumnal visit to Roan Mountain, by Messrs. Gray, Engelmann, Canby and Redfield, in 1876, had inspired the whole party with a strong desire to take a more leisurely survey of this mountain in the season of Rhododendron-flowering. Certain ladies shared in this desire, and in a general longing for rough mountain travel. Their society added a zest to the expedition, their powers in mountaineering were the admiration of all beholders, and their zeal and helpfulness in plant-drying cannot be too highly extolled.

In the rapid flight by rail through Virginia only the most obvious botanical features could be noted. The forests passed through were largely of oaks and of *Pinus inops*. Occasional clumps of *Kalmia* were just coming into flower, and the evening air was redolent of the *Magnolia glauca* of the swamps. Entering North Carolina from Danville, the journey to Salisbury, and thence westerly to Statesville, was through the middle district of the State, a wide territory with topographical and botanical features differing much from those of the eastern sandy pine region on the one hand, and of the elevated valleys and still loftier mountain ridges of the western district on the other.

At Statesville was the first opportunity for herborizing. Here the party were received by Mr. Hyams and placed under the hospitalities of Mr. Wallace, the principal merchant of the town, who made them literally "at home" in his pleasant family, and furnished facilities for a close botanical examination of the vicinity. Under the guidance of Mr. Hyams they visited a pretty forest glen where was a lovely grove of young trees of *Magnolia macrophylla*. The gigantic cream-white flowers, odorous but not fragrant, were in full perfection, and one hardly knew whether the flowers or the enormous leaves with their glaucous bloom were most to be admired. In the more open glades were here first met the gay *Silene Virginica* and the delicate *Houstonia purpurea*, which afterwards so often presented themselves. In woods and copses *Clematis Viorna* and *Gonolobus hirsutus* were climbing, and near by were collected *Thaspium barbinode*, *Ligusticum actæifolium*, *Berberis Canadensis*,* *Asclepias variegata* and *Asarum arifolium*. In open pastures grew *Tetragonotheca helianthoides* and *Schrankia angustata*.†

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* This native *Berberis* belongs to the mountains, mostly to those of Virginia. It was a surprise to us that Mr. Hyams had detected it here in the middle country.
A. G.

† Want of time prevented an excursion to Lincolnton to search for *Darbya*, which the late Dr. Curtis found in the bend of the Little Catawba, not far from that town, on ground which is now mainly brought into cultivation. Only the male flowers of this rare shrub are known. Any botanist who can search for this plant in that region should put himself into communication with the venerable Dr. C. L. Hunter, of Lowesville, in Lincoln Co., who knows the locality. If no longer to be found there, the banks of the stream should be explored further down. The plant should also be sought in the country around Macon, Georgia. A. G.

A visit to the root and herb ware-house belonging to Wallace Brothers, and under the charge of Mr. Hyams, furnished evidence that this branch of industry has reached an extent and importance of which few are aware. The printed catalogue of indigenous plants, dealt in by this house, enumerates about 630 species, equal to the whole flora (less grasses and sedges) of a moderate district. These simples find a large market both in this country and Europe, and the orders come mainly from the wholesale druggists and the manufacturers of patent medicines. Think of a single order for *fifteen tons* of *Hepatica triloba!* The name *liver*-wort will suggest the object, and demonstrate the efficacy!

Joined by Mr. Hyams, the party proceeded by rail to the Swananoa Gap of the Blue Ridge, the present terminus of the Western Railroad of North Carolina. The road is built by the State, with convict labor, and is carried up this mountain pass by a series of curves and loops, on high embankments and through deep cuttings, finally piercing the ridge by a long tunnel, altogether forming a piece of engineering not surpassed by any similar work in this country. Soon the road will be completed through Asheville into Tennessee, and the lovers of the picturesque can find nowhere on the rail more striking scenery than they will here behold. A morning spent in rambling about this point revealed some of the features of the flora of the mountain district.* The *Azalea calendulacea* was here first seen, and its bright candles afterwards lighted up many a forest vista. *Calycanthus lævigatus* was collected on the flanks of a wooded rocky eminence well named Rattlesnake Knob—two of these venomous reptiles falling victims to the club of Hyams. "What, locusts so early here!" cries one of the party, when the shrill music began. "Locusts in these parts means rattlesnakes," was the rejoinder of a more experienced member. The sounds seemed to come from a little distance to one side of the broken rocks on which we were standing; it was rather exciting to find that the pair of reptiles which gave the kind warning were among the stones almost under our feet.

Everywhere abounded *Galax aphylla; Tephrosia Virginiana* was frequent; and, on the rocky summit of the Knob, *Asplenium montanum* and *Asplenium Ruta-muraria* were found, but none of the rarer ferns. Returning to the eastern foot of the Gap, through the gorge in which the stage road passes, admiration was divided between the wild magnificence of the glen, and the rich and varied character of the trees which clothed its sides, and which were the special admiration of our arboriculturist. Conspicuous among the latter were *Liriodendron tulipifera*, *Magnolia Fraseri* and *Magnolia Umbrella* along with a few noble hemlocks and the silver-leaf linden. Among the shrubs were two or three species of *Cratægus*, *Symplocos tinctoria*, *Halesia tetraptera* and *Ilex mollis.* Of the more humble plants were *Menispermum Canadense*, *Astilbe decandra* and *Galium latifolium.* To the disappointment of all, the *Rhododendron maximum* this year withheld its wonted display, most of the flower-buds having been blasted by the severe cold winds at the end of the previous winter. This proved to be the case in all the region visited.

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* The height of Swananoa Gap is 2,657 feet above tide. Rattlesnake Knob is probably nearly 3,500 feet high.

Being now in McDowell County, the Shortia locality was visited, under the guidance of Mr. George M. Hyams, the actual discoverer. In the secluded and well-protected station, well overshadowed by Rhododendron and Magnolias, was seen the little colony of the plant so long sought, and by many so long doubted*. Its companions were *Mitchella repens*, *Asarum Virginicum* and *Galax aphylla*. The space over which the plant extended was perhaps 10 feet by 30, and in all there may have been from 50 to 100 plants. As the plant multiplies by stolons, it is remarkable that its area should be thus restricted. And since in the struggle for life, of two allied plants the weaker "must go," Dr. Gray suggested the probability that its stronger cousin, the *Galax*, had crowded out the *Shortia*. And here indeed, in what may be the last foothold of the rarity, *Galax* appeared to be actually doing so. Yet the plants, though comparatively few, were vigorous and healthy. Other stations may be looked for; but they must be hard to find. When we consider the long search which has been made for this plant, how all the mountain region of the Carolinas and Tennessee has been examined by the sharp optics of Buckley, Rugel, M. A. Curtis, Dr. Gray, Canby, Leroy and Ruger, the Vasey's, elder and younger, Chickering and others, it is very certain that if there be other localities they must be "few and far between."

In June even the fruit of this vernal plant had mainly gone by; but Dr. Gray secured a capsule or two with some seeds.†

At the Shortia station *Azalea arborescens* was observed in bloom; but much of it was afterwards seen throughout the mountains. At first sight it might be mistaken for *A. viscosa*, which is also common in the region. But it blooms earlier, has a larger corolla with longer tube, and in the drying an excellent character manifests itself in the vanilla-like scent of the leaves.‡

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* We cannot always trust too confidently to tickets, which may be written subsequently and based on imperfect memory. Michaux's *Woodwardia Banisteriana* —which from his description and citation of Plukenet's figure must be *Woodwardia Virginica*—is ascribed by Michaux to "montibus Carolinæ," where it has never since been found, while it is well known to abound in the swamps of the lower district.

† These confirm the character of the genus, having a close-fitting seed-coat, just as described in the original character, drawn from a single seed which was found in an open capsule of Michaux's specimen, and was destroyed in the autopsy. A good figure of *Shortia galacifolia* with a detailed account of the genus and order, by the present writer, is contained in the seventh volume, 6th series, of the Annales des Sciences Naturelles. Since its publication a flower of *S. uniflora* (kindly sent by Dr. Maximowicz) has been examined. Its anthers show indications of being inflexed on the apex of the filament in the manner of the American plant, leaving hardly anything but the shape of the leaf to distinguish the two species. A. G.

‡ It is open to question whether this shrub, which we have called *Azalea* or *Rhododendron arborescens*, is actually Pursh's species. He mentions its "large, abundant, rose-colored flowers," but in ours these are white, or with only the slight roseate tinge which *A. viscosa* also has. And the habitat given is "On rivulets near the Blue Mountains, Pennsylvania;" also in John Bartram's garden. Bartram, however, may have brought it from the southern Alleghanies. And Pursh was notoriously untrustworthy as to localities, appending his *v. v*, to plants from districts he can never have visited. A. G.

At Morganton the party was completed by the addition of Mrs. Gray, her brother, and his two daughters—the lay members of the expedition, but sharers in all botanical labors. One day served for the needful preparation and for a little botanizing on the banks of the Catawba, and on the morning of the 11th of June the expedition moved toward Table Rock with all its equipments. Four of the party on horses led the way. A one-horse buggy, which proved admirably adapted to rough roads, conveyed two. A three-seated waggon with a pair of mules, driven by Jeff,—a greyheaded mulatto and an admirable driver—assisted by his boy, took the remainder, which included Mr. Hyams and his boy Fred, a lad of eleven or twelve, whose knowledge of botany already nearly equalled that of his father. Another rough country wagon, drawn by mules and driven by a white man, conveyed the baggage and brought up the rear.

Just before sunset the house nearest Table Rock was reached, that of Mr. Sisk, who is accustomed to entertain visitors and guide them to the summit, where his field lecture upon the geology of the region, and upon cosmogony in general, forms a part of the entertainment. And here be it noted that a shower after we were housed, and another while equally housed for the mid-day meal, and a third on a subsequent afternoon, requiring an hour's halt, comprise all the rain which the expedition encountered; although the region is generally showery in summer.

On the 12th was made the ascent of Table Rock, a most remarkable summit, belonging to the Blue Ridge system, presenting in one direction the tabular profile which gives it its name, and from another a sharp conical outline not unlike that of the Matterhorn.* The botanists returned from it laden with plants, and it was curious to see among them so many of the species which are associated with the sandy barrens and swamps of southern New Jersey, such, for instance, as *Xerophyllum asphodelioides*, *Leiophyllum buxifolium*, *Amianthium muscætoxicum* and *Hudsonia montana*, the last indeed a species peculiar to Table Rock, but closely allied to the *H. ericoides* of New Jersey. *Rhododendron punctatum* was collected on the summit, though not in flower, also *Menziesia globularis*. *Scirpus cæspitosus* was there, true to its preferences. *Vaccinium corymbosum* var. *pallidum* was common here and at other points among the mountains. *Galax aphylla*, now just in flower, abounded here and throughout the mountain forests, and its glossy circular leaves and slender spikes of white flowers make it one of the most charming of the woodland plants.

A drive of a dozen miles the same afternoon brought us—the first guests of the season—to a large and comfortable house of entertainment, at Piedmont Springs, charmingly situated near the head of a picturesque deep valley. Both host and hostess were remarkable for their height,—their charges for their lowness.

Long as June days are, and short as a journey of 13 or 14 miles might seem to be, the next day was none too long to bring the party over Jonas' Ridge (a part of the Blue Ridge) and to Franklin's, a farm house near Linville Falls. This is hardly the place to recount the adventures of the day—the roughness of the road, remarkable even for these mountains,—the wayside lunch—the break down of the baggage-wagon—how Canby "put his foot in" a nest of —— "moonshiners," to the equal trepidation of the discoverer and the discovered, and the rapid making of tracks by both—how the faithful Jeff was left to pass the night alone upon the mountain-side in charge of mules and baggage—and how the party with much ado succeeded in reaching their destination after night-fall. At sunset the culminating point of Jonas' Ridge, free from trees and at a height of not far from 4,000 feet, afforded a view of almost unequalled extent and magnificence, in which the Black Mountain and Grandfather predominated, and under the lee of some rocks the first specimens were collected of *Vaccinium erythrocarpon* and *Saxifraga Careyana*. The plants noticed during this day and the next were *Azalea calendulacea*, *Menziesia globularis*, *Calycanthus lævigatus*, *Boykinia aconitifolia*, *Lonicera flava*, *Zizia integerrima*, *Phlox glaberrima*, *Asarum Virginicum*, *Pogonia divaricata*, *Calopogon pulchellum*, *and Clintonia umbellata*. In the gorge at the Falls the best specimens of *Asplenium montanum* were found. Here too *Rhododendron Catawbiense* was found growing mixed with *R. maximum* and equally tall, reaching the height of 12 or 15 feet, and here already dropping its corollas before the middle of June. This caused forebodings (not, however, to be realized) that we might be too late for the floral display of this species on Roan Mountain, where it reigns supreme.*

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* Its height is 3,918 feet above tide-water, according to Prof. Kerr, the State Geologist. It commands a magnificent view.

Linville Falls are worth visiting, and are readily accessible from the south, by the Linville mountain road; but both the Falls and the botanizing fell below our expectations.

It was hoped that *Shortia* might be found on the Linville; but all search was in vain. To increase the chances, now that we were on Michaux's track (as shown by his diary), Messrs. Canby and Sargent, on horseback, made a two days excursion down the North Cove, and up Turkey Creek, and over to the upper waters of the south fork of Toe River, and thence to Bakerville; while the rest of the party came directly to the north fork of the Toe and so by the nearest wagon road to Bakerville. Yet nothing was seen of *Shortia*.† Plenty of *Azalea arborescens* was met with of a size to justify the specific name,—shrubs of 15 feet in height, on stems two or three inches in diameter, and laden with the large and beautiful blossoms. It particularly affects the rocky and wooded banks of water courses, the spreading spray overhanging the stream. Both routes were made glorious, also, by endless displays of *Azalea calendulacea* and of *Kalmia*, both in their prime, backed by a wealth of greenery, and offering to our admiration varied hues and new combinations at every turn.*

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* Our own observations would restrict *Rhododendron Catawbiense* to the tops of the higher mountains, or to some such peculiar station as this at Linville Falls at somewhat lower elevations. But Mr. Howard Shriver pointed out to me a locality at the foot of the low mountains which rise behind Wytheville in Virginia; and, what is truly extraordinary, Prof F. W. Symonds, of the University of North Carolina, sends specimens, in full bloom on the third of April, on a steep and shaded bank on Morgan's Creek, near Chapel Hill, in the middle upper country of the State, flourishing at an elevation of only 500 feet above the level of the sea!
A. G.

† The best hopes of the rediscovery of Michaux's habitat, in my opinion, are concentrated upon that portion of the Blue Ridge which directly flanks the Black Mountain ranges, and upon the eastern face of the latter from Swananoa Gap northward.
A. G.

Roan Mountain, which the main party reached on the 16th, and the detachment the following day, rises upon the boundary between North Carolina and Tennessee. It reaches a height of 6,306 feet according to Guyot's measurement. Though inferior in elevation to many of the wooded peaks of the Black Mountains and of the Smoky Range, its ample and varied summit is bare of trees, and for that reason the more attractive to botanists as well as to lovers of mountain views. Dr. Gray visited it in 1841 and again, with a portion of the present party, in 1876. The observations made by him on his first visit are recorded in *Am. Jour. Science*, 1st ser. Vol. XLII., pp. 1–49. (Oct., 1841). Other botanists have since visited it, and its flora has been pretty well explored. Good carriage roads to the summit from each side have now made it very accessible, and a comfortable, well-kept hotel has been established upon it, so that henceforth it will be a popular resort. Dr. Gray has well said that it is the most *beautiful* mountain east of the Rockies. It has not the stern desolation of Mt. Washington's shattered dome, but instead presents a grassy park of hundreds of acres, studded with copses of the brilliant *Rhododendron Catawbiense.* When the party reached the summit, this lovely shrub, in countless numbers, was just opening its crimson and rosy flowers, and surely no floral display could be richer. Beneath the rhododendrons, and also in the crevices of the rocky ledges, were rich cushions studded with the white stars of *Leiophyllum buxifolium*, of a variety which, from its depressed and compact growth, Dr. Gray has called *prostratum.* The natives call it mountain heather. The grassy sward was blue with large patches of *Houstonia serpyllifolia*, of more decided color and forming larger mats than our own *cærulea.* Upon the higher ledges at the east and west ends of the mountain were found *Geum radiatum* just coming into flower and, sparingly, *Geum geniculatum.* A stunted and very pretty variety of *Houstonia purpurea* was common in exposed stony places, and on the precipitous cliffs below the bluff grew *Sedum Rhodiola.* On the rocky ledges on the brow of the mountain were collected *Saxifraga leucanthemifolia* (hardly yet in flower,) *Carex juncea*, *Carex canescens*, var. *vitilis*, *Menziesia globularis*, and *Vaccinium erythrocarpon* with its curious revolute corolla—a cranberry-blossom upon a whortle-berry bush! *Potentilla tridentata* on the open rocks, and *Clintonia borealis* with *Oxalis Acetosella* growing in the shade of the balsams reminded one of the mountains of New England and New York, and so did *Maianthemum Canadense* in the mossy cushions under the Rhododendrons. *Veratrum viride* and *Alnus viridis* mark the gullies. Much of the summit prairie flora has doubtless been destroyed by the large herds of cattle, horses, and sheep, which are every summer sent to the mountain top for pasture. Canby and Sargent rejoined the party upon the mountain on the 17th, and several days were then devoted to excursions in various directions upon the summit and flanks of the ridge. In these excursions were collected *Trautvetteria palmata*, *Thalictrum clavatum*, (abundant on the flanks of the mountain), *Diphylleia cymosa*, *Ilex monticola*, *Saxifraga Careyana* (growing in the shade of overhanging rocks,) *Ribes rotundifolium*, *Sedum ternatum*, *Sambucus pubens*, *Diervilla trifida*, (but not *D.*; *sesilifolia*), *Phacelia fimbriata* (an exquisite little species allied to the *P. Purshii* of the western States), *Castilleia coccinea*, *Streptopus amplexifolius*, *Streptopus roseus* and *Paronychia argyrocoma*, the latter upon the rocks at Eagle Cliff.

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* *Euphorbia Darlingtonii* seems to abound on the western slopes of the Blue Ridge all the way to Virginia, and is especially prevalent in Ashe Co.

A. G.

Many very interesting species were collected upon the southern flank of the mountain, in and below the belt of *Abies Fraseri.* Near springs and rills, not far below the summit, *Cardamine Clematitis* abounds. This species was many years ago collected by Rugel in the Smoky Mountains, and was sent by him to Shuttleworth, who distributed it under the above name. It is enumerated in Watson's Index, but has not been described.* Other plants collected on this slope were *Saxifraga erosa* (abundant in wet places), a single plant of the rare *Aconitum reclinatum*, not yet in flower, and a lily which Watson has recently named *Lilium Grayi*, probably too near to *L. Canadense.*

Of the arboreal vegetation, the *Abies Fraseri* mixed with *A. alba* reach the highest, comprising most of the forest above 5500 feet. These trees clothing all the summits of the Black Mountains doubtless suggested their name, their hue at a distance being dark and sombre. There is some reason to believe that this forest has been encroaching upon the bald portion of the summit, but as it is now being largely cut for fire-wood and fencing, any such encroachment is likely to be checked, perhaps too effectually. Below the firs the deciduous trees begin with *Acer spicatum*, *Cratægus tomentosa*, var.

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* **This desideratum may here be supplied.**

CARDAMINE CLEMATITIS, Shuttleworth in coll. distrib. Rugel. Species distinctissima, glaberrima, semi-subpedalis e rhizomate tenero; foliis radicalibus primariis reniformibus subintegris, cæteris trisectis (segmentis rotundatis nunc angulatis, terminali majori reniformi-cordato seu angulato-trilobo) vel supremis oblongatis trilobis, petiolo basi dilatata insigniter sagittato-appendiculato, auriculis subulatis; racemo brevi laxo; petalis albis (lin. 3 longis) calyce plus duplo longioribus; siliqua angusto-lineari compressa in stylum sat longum attenuata; stigmate parvo.—Wet ground along streamlets in the higher Iron or Smoky Mountains of North Carolina and Tennessee, collected in 1844 by Rugel, and about the same time by Buckley. A specimen from Buckley was by me confounded with *C. rotundifolia*, and is the only authority we know of for attributing to that species occasionally trisected leaves, as is done in the Manual of the Botany of the Northern States. An imperfect original specimen from Shuttleworth was mixed up with a Florida species, intermediate between *Cardamine* and *Nasturtium*, first received from Leavenworth without fruit, and referred in the Supplement to the first volume of Torrey & Gray's Flora to *N. officinale*; it was afterwards received from Buckley, then from Shuttleworth (coll. Rugel), first as *Cardamine curvisiliqua*, Shuttl., and again as ***Nasturtium stylosum***, Shuttl. ***Proc. Am. Acad. xx.*** **45.** A. G.

punctata, beech, yellow and black birches, buck-eye, and soon upon the rich soil of the mountain side come large trees of *Prunus serotina*, with sugar maples, chestnut, both the lindens, white and red oaks, hickories, cucumber trees, tulip tree, and all the trees which compose the magnificent forest of the southern Alleghanies.

All too soon, on the 21st, the pleasant companionship was broken up. Dr. and Mrs. Gray, having accepted the kind invitation of Mr. Arthur Cowles to visit some points in Ashe Co., which were explored by Dr. Gray in his first visit of 1841, left in company with him, for a three days drive to his home at Deep Gap, and two or three more to the railroad at Marion, Virginia. Prof. Sargent and Mr. Canby, with Mr. Loring and family, descended the northern side of the mountain the same day to Wilder's Forge, and thence over the Iron Mountain to Johnson City; and Mr. Redfield followed a day or two later. In the descent were noticed on the lower flanks of the mountain, *Azalea calendulacea*, *Habenaria pscycodes* and *Asclepias phytolaccoides*. In crossing the Iron Mountain range were seen *Diphylleia cymosa*, *Astilbe decandra*, and *Cardamine rotundifolia*. *Aristolochia Sipho* frequently displayed its pyramids of huge cordate leaves. Several species of *Magnolia* abounded in the gorges of the Iron Mountains, and there were sufficient indications that a thorough exploration of that range would yield a botanical harvest. Among the limestone rocks a few miles east of Johnson City (a locality noticed in 1876) was collected *Asplenium parvulum*, associated with *Camptosorus rhizophyllus*.

At Jefferson, the county seat of Ashe County, Dr. Gray made a hurried ascent of Negro Mountain, which rises close to the village. True to his recollection of 1841, he went directly to the point where he then discovered *Aconitum reclinatum*, and found it, but not yet in flower. Roots were taken for cultivation in the Botanic Garden at Cambridge. There he also collected *Saxifraga Caroliniana*, but not *S. Careyana*, which alone was found further south. A fresh comparison of the two very similar plants confirmed the published characters of the species. J. H. R.

NOTES ON CYPERUS, L. by N. L. Britton.

§ 345. **Cyperus cylindricus.**—(Mariscus cylindricus, Ell.; Cyperus ovularis, Torr., *Var.* cylindricus, Torr.)

Culms 6 in. to 20 in. high, smooth, triangular; leaves linear, roughish on the margins especially near the apex; involucre of about 6 very unequal rays, rough on the edges; umbel about 7 rayed; rays ½ in. to 2½ in. long; heads cylindrical, or sometimes oblong, of numerous linear spikes, the lower of which are somewhat reflexed; spikes usually 2-flowered, the two lower scales empty; scales ovate, obtusish; achenium linear-obvate, or linear oblong, triangular, shorter than the scale; styles trifid; stamens three. Roots fibrous, from clustered tubers. Very distinct from C. ovularis, Torr., with which it has been confounded.

Abundant in the Pine Barrens of New Jersey; Coney Island; Tottenville, S. I.; Gravesend and Rockaway (W. H. Leggett);

Aiken, S. C., (H. W. Ravenel); Southern N. J., and Delaware, (W. M. Canby,) vide June BULLETIN.

Cyperus erythrorrhizos, Muhl.—This Western species was found at Wading River, Suffolk Co., L. I., in 1872, by Messrs. E. S. Miller and Leggett, making a very remarkable addition to its geographical range. Dr. Torrey, in his "Catalogue of Plants within 30 miles of New York City," records it as common in wet meadows; this assertion certainly does not hold true now, the nearest locality for the plant being in Pennsylvania. Perhaps the statement in the Catalogue is meant to apply to C. erythrorrhizos, Torrey, which is C. Michauxianus, Schultes, and is found frequently around New York.

Cyperus dentatus, Torr.—In the State Flora, Dr. Torrey describes this species as having the "rhachilla naked." Gray's Manual however, says "axis wing-margined." I have a large number of specimens of the plant from different localities, and in all of them, the axes of the spikes are naked. Have we two forms of the species, or is the Manual at fault?

§ 346. **Self-Defence in Plants.**—This subject has been studied by *Prof. Kerner* of late, but Vergil seems to have thought about it before the Christian era. He is foretelling a return of the golden age, and uses this remarkable expression, ECLOG. IV. 28.

Molli paulatim campus flavescet arista,

where *molli* has puzzled commentators. Ladewig interprets it rightly, "with smooth ears, since they will have no more need of the sharp awns for protection against the birds which will then become harmless." Martyn takes the same view, and quotes Cicero as thus accounting for the beard of wheat. *Paulatim* is probably only put in to help paint the grain gradually growing golden under the summer sun; it can hardly hint at the gradual change of evolution, and yet Vergil had, with the Epicurean School, speculated much on kindred subjects.

§ 347. **Vitis.**—It is not yet too late in the season to recall to collectors Dr. Engelmann's request for contributions throwing light on the limits especially of *V. cordifolia* and *V. riparia.* On pp. 233–4, and 310–11 of the current volume of the BULLETIN he pointed out clearly the distinctions; he has since told us that *V. riparia* may also be known by the finer fibres of the shreds of the separating bark. It is desirable to learn how far south and east *riparia* reaches, how far north and west *cordifolia.* For the distinctions the notes referred to should be studied, but we may briefly state as a reminder, that *riparia* has a bright, deep green leaf (above) with a truncate sinus, stipules longer, with the diaphragm of the nodes ½–¼ line thick, and fruits earlier; *cordifolia* has a dull, paler surface, acute sinus, rounded short stipules, with diaphragm interrupting the medullary tissue in the last year's cane ½–1 line thick, and a stronger fragrance to the leaves.

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The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 P. M. Botanists are invited to attend. DR. THURBER *the President of the Club may be found at* 245 *Broadway.*

Vol. VI., No. 57.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Sept., 1879.

BRYOLOGICAL NOTES, by C. F. AUSTIN.

§ 348. **Orthotrichum Lescurii,** AUST.—Musc. Appalach. n. 163.—*O. cupulatum*, var. *minus*, Sulliv. Icones, Suppl. p 61 t. 44.

Autoicum, pulvinatum, pusillum, fastigiato-ramosum, saturate viride. Folia madefacta aperta, anguste lanceolata, acuta, indistincte minutissime papillosa, margine revoluta, costa sub apice evanida, cellulis superioribus distinctis majusculis quadrato-rotundis, basilaribus paulo longioribus et pellucidioribus vix latioribus subseriatis. Capsula immersa vel subemersa, late ovali, distinctissime 8-costata, (costis brunneis,) demum sub ore concolori valde constricta, collo brevissimo basi obtuso in humido haud vel vix sulcato. Peristomium singulum, dentibus 16 longis lanceolato-sublatis albescentibus elegantissime crebre punctulatis sat uniformibus et uniformi-articulatis vix nodulosis erectis vel demum subreflexis æque distantibus linea mediali notatis versus apicem hic illic pertusis. Operculum depresso-convexum, breviter apiculatum. Calyptra lata, brevis, parce pilosa 16-striata. Flos masc. gemmiformis.

On dry shaded granitic or trap rocks, Palisades, &c., New Jersey; also Pennsylvania, *Porter*, Connecticut, *F. N. Pease*, Salem, Mass., *Robinson*, Canada West, *Macoun*.

In size and appearance much like *O. strangulatum;* but the habitat (on rocks) is different, the capsule is broader, peristome and leaves very different, &c. Notwithstanding such high authorities as Sullivant and Lindberg have persisted in confounding this species with *O. cupulatum*, I am compelled to consider it one of the most distinct, most constant in its characters and most readily determined species of the genus. All the forms of *O. cupulatum* have the leaves much broader, less revolute on the margin, with the upper cells smaller and more obscure and granulose, the basal cells much larger, not arranged in rows, and much more hyaline; capsule less distinctly and 8—16-ribbed, (the ribs not colored,) usually more urceolate and more exserted, paler, with a much longer, acute, sulcate collum, which tapers far down into the (sulcate) pedicel; peristomal teeth usually of the same pale yellow color as the capsule, shorter and broader, distinctly nodulose, geniculate and uneven, much more closely and irregularly articulated below, more distantly so above, and marked with vermicular striæ (never punctulate) and with a more or less zigzag scarcely perforated medial line. The mouth of the capsule is composed of about 12 rows of solid vertically much compressed cells, and furnished with a dark colored rim. In *O. Lescurii* this part of the capsule is not at all (or but slightly) colored, and is composed of about 8 rows of much less solid cells. Very rarely there are present one or two extremely long and delicate filiform ciliæ!

Orthotrichum Porteri, AUST. Musc. Appalach. n. 161; *O. Peckii*, l. c n. 162.—*O. cupulatum*, var. *β Peckii* et var. *γ Porteri*, *Sulliv.* Icones Suppl. p. 61.—*O. Porteri* et *O. calcareum*, AUST. in litt. ad SULLIV., 1869.

O. anomalo proximum; differt tamen caule breviore, capsula immersa vel subemersa multo breviore plerumque 8-striata, foliis magis hygroscopicis brunneo-fuscescentibus, peristomii dentibus crebre punctulato-striolatis.

On shadeless dry limestone rocks; usually with a southerly exposure, New Jersey; also Pennsylvania, *Porter*, New York, *Peck*, Georgia, *Ravenel.*

This species, in the shape and texture of the leaf, in the general form and texture of the (shorter) capsule, and in its peristome (with a fragile membrane lining the teeth, &c.,) is almost exactly like *O. anomalum.* It is about the size of *O. Lescurii ;* from which, however, it is readily separated by its brown foliage; by its darker colored narrower (often oblong) capsule acute at the base and somewhat defluent into the stouter and usually longer pedicel, and composed of much smaller and more solid cells, the mouth of a different structure, the usually 8 (8–16) ribs scarcely more deeply colored, narrower and less regular; by its brown peristome composed of more solid less uniform nodulose punctate-striolate teeth, which are much more closely articulated at the base and less so towards the apex, and lined by a fragile membrane; also by the broader and shorter, more hygroscopic, more granulose leaves, composed in the upper part of smaller and at the base of broader and more pellucid cells. Capsule usually not sulcate in the collum (at the base) when moist.

O. anomolum has the longer, much exserted capsule of a similar texture throughout and with a similar collum; but the peristomal teeth are vermiculose (not punctate)—striolate, with the striæ both more distant and more distinct. In both species the fragile inner membrane is often broken up, here and there, into quite well formed ciliæ alternating with the teeth.

All the forms of *O. cupulatum*, including *O. parvulum* from Colorado, have the capsule paler, its ribs more evident and straighter when moist, the collum more acute and deeply sulcate and tapering gradually into the pedicel, peristome different (paler and never (?) lined with a membrane), and leaves of a slightly different texture.

Ten years ago, I pointed out to Sullivant, the strong affinity of this species with *O. anomalum*, and cannot conceive why he should have considered it a form of *O. cupulatum.*

Orthotrichum Hainesiæ. *n. sp.*—Autoicum; plantæ mediocres, cæspitoso-pulvinatæ superne sordide virides inferne fuscæ; caule parce diviso, foliis flexuosis subpatentibus siccitate vix mutatis elongato-lanceolatis subcarinatis pro more acutis, papillis longiusculis conspersis, margine revolutis, costa subpercurrente, cellulis superioribus mediocribus punctiformibus fere rotundis discretis, basilaribus haud latioribus subseriatis ovalibus et auguste oblongis hand pellucidis; capsula lævi vel obsolete striata siccitate cylindriacea humiditate obovato-cylindrica in pedicello siccitate sulcato sensim defluente longiuscule exserta, operculo depresso-conico breviter rostellato, peristomii dentibus 8 erectis pallido-luteis apice subtruncatis læviter subquadrifidis lævibus obscurissime articulatis subopacis, linea mediali valde indistincte haud ad basin procedente notatis, ciliis 8 paulo longioribus subulato-linealibus, linea mediali obscure notatis, sporangio fere a medio ad basin in pedicello anguste cylindrico constricto; calyptra angusta parce pilosa vel fere nuda striato-plicata; flore masc. majusculo gemmiformi tumido polyphyllo, antheridiis breviter stipitatis, paraphysibus paucissimis.

Rocks, Colorado, *Mrs. Mary P. Haines.*

Readily distinguished by the lower half of the sporangium being constricted into a narrow cylindrical pedicel. On account of the leaves being scarcely changed in drying it has much the appearance of *O. pulchellum;* which also has a similar but rather shorter and more tumid pedicel to the sporangium.—The forms of *O. speciosum* have more hygroscopic leaves, but somewhat similar in shape and texture, capsule less exserted, a different sporangium, peristomal teeth reflexed when dry, ciliæ 16. &c.—*O. lævigatum* is said to be devoid of ciliæ, &c.—*O. Sullivanti* grows on trees, has peristome reflexed when dry, leaves of a different texture, &c.

Orthotrichum Macouni. *n. sp.*—Autoicum, robustum, late dense cæspitosum; cæspite lutescente inferne fusco, caule subunciali parce diviso, foliis siccitate erectis humiditate strictiusculis subapertis ovato-lanceolatis acutissimis subcarinatis minute papillosis apice integerrimis margine revolutis, costa subcontinua, reti perminuto obscure granuloso basilari paulo latiore vix pellucidiore; capsula augustissime cylindracea lævi pallido-straminea in pedicello siccitate valde sulcato longe defluente longe exserta, peristomii dentibus 16 brevibus subulatis siccitate erecto-incurvis pallidis hyalinis distincte 8—10-articulatis minute granuloso-papillosis. Ciliis 8 dimidio brevioribus angustis, operculo longe apiculato, calyptra parce pilosa.

Rocks, Cascades, British Columbia, 1875, *Macoun.*

Closely related to *O. Kingianum,* Sulliv.; but compared with a specimen from *James* ex Herb. *Lesqx.* it differs as follows:—More robust; leaves less erect, longer, less densely papillose, with the upper cells larger and less granulose, the lower ones much less enlarged and in the older leaves not at all pellucid; capsule paler, narrower, exactly cylindrical when moist (not obovate-cylindrical), &c. —Compared with the description and figures in *Icones Suppl.* p. 74, t. 55, the leaves are much more acute and of a more uniform texture throughout, costa extending nearer to the apex; capsule not obovate when moist (cylindrical), the mouth not at all ampliated when dry, the teeth not punctulate but granulose, not brown but straw-colored.

Orthotrichum Rauei, *n. sp.*—*O. specioso* var. *polycarpo* (*O. leiocarpum,* Hedw.) peraffine; differt tamen statura minore, capsula magis exserta, peristomii dentibus erectis vel subpatentibus pellucidis distincte articulatis magis divisis, ciliis octonis (semper?) quam dentibus longioribus.

Colorado, *Brandegee* (*Rau*).

Male flower gemmiform, axillary. Capsule more or less distinctly 8 striate at both the base and apex when dry, more exserted than in any form of *O. speciosum,* the teeth closely and distinctly articulated.

Orthotrichum fallax, SWARTZ, Var. **truncatulum,** AUST.—Recedit a forma typica, foliis apice sæpius hyalino-apiculatis, capsula augustiore oblonga siccitate cylindrica tota longitudine constricta latius costata basi truncatula, peristomii ciliis dentibus æquilongis, etc.

Base of old buildings, Illinois, *Hall*: rare.

Male flower terminal on a stem-like branch; antheridia small, long-stipitate, eparaphysate (always?)—Readily distinguished from the typical *O. fallax*, (which is given in *Musc. Apallach*, under the name of *O. pumilum*,) by the base of the capsule being truncate and not inflated when dry.

Dicranum flagellare, HEDW. Var. **subfluitans,** AUST.—Foliorum forma et textura normalis; differt tamen caule subfluitante elongato gracili subflexuoso simplici vel subramoso, foliis dissitioribus.

In depressions on the surface of flat rocks on the top of Shawangunk (*Shongum*) Mountain, at Sams Point, New York. Sterile.

Dicranum longifolium, HEDW., Var. **strictius,** AUST.

Differt a forma normali, caule longiore rigidiore subfluitante teretiusculo leniter flexuoso, foliis brevioribus erectis subappressis fere strictis.

With the preceding

Dicranella Schreberi, HEDW., Var. **occidentale,** AUST.

Recedit a forma normali, foliis sæpe integerrimis, cellulis dimidio angustioribus.

Portland, Oregon, *Nevius.*

The moss referred to *Cynodontium Canadense*, MITT., by me in Bot. Gazette, Vol. II, p. 96, is also a form of *D. Schreberi*, and near this variety, but the cells are more lax.—*Dicranum Macouni*, AUST., l. c. is a more lax form of *D. elongatum*, SCHWGR. *Dicraniodontium nitidum*, JAMES, is a form of *D. longifolium.*

§ 348. **On the Fertilization of Euphorbia (Poinsettia) pulcherrima.**—The whorl of brilliant scarlet bracts, to which this plant owes its beauty in the flowering season, is evidently designed to attract insects from a distance to the inconspicuous flower cluster which it surrounds. Within this whorl the flowers are grouped in a number of involucrate clusters, each of which consists of a central pistillate, and a considerable number of staminate flowers. Each of these flowers is a single organ with a pedicel and subtending scale. On the outside and near the top of each involucre is a very large yellow nectary in which nectar is freely secreted. A very few of these clusters have their pistillate flowers perfect to the eye, but in the greater number they are quite abortive or, where externally perfect, their ovules do not seem to be developed. When a cluster becomes mature its gland begins to secrete, and its pistil, if not entirely abortive, protrudes, expanding its three slightly forked stigmas, which are now in a receptive condition. This state apparently lasts but a few days, after which one or two stamens are exserted by the elongation of their pedicels, and shed their pollen. After dehiscence they become deflexed and are succeeded by others which go through the same process. After all have matured, the cluster falls off—unless the pistil has been fertilized, and this seems never to occur, through imperfect development, in plants artificially grown. During this successive development of the stamens, the pedicel of the pistillate flower elongates sufficiently to cause the entire ovary to be exposed.

Growing in our laboratory, this plant is covered when in flower by myriads of minute red ants (*Myrmica molesta*), which may be seen, three or four at a time, with their heads thrust to the very bottom of the nectaries, giving most eloquent testimony to the presence of nectar. Crawling back and forth over each cluster, and from cluster to cluster, they cover everything with pollen, and would thus fertilize the pistillate flowers were they not abortive.

In a state of nature it is probable that each cluster would possess a well developed pistillate flower, which could not, from its earlier maturity, be fertilized by pollen from stamens of the same cluster. The small flies that are known to fertilize many species of Euphorbia, or small bees, to either of which the nectaries of this species seem well suited, would probably carry pollen from cluster to cluster in a given plant; they would also, in flying from one plant to another, effect crossing in its truest sense. In any case, crossing *must* occur between distinct flower clusters.[2]

W. TRELEASE.

Cornell University, Ithaca, N. Y.

§ 349. **Pursh's Station for Scolopendrium rediscovered by the Syracuse Botanical Club.**—A member of the Torrey Botanical Club, a dear lover of Ferns, has a high regard for Pursh, whom he thinks hardly used as regards the trustworthiness of his localities, and always rejoices when he is proved right where he has been doubted. The news we have to offer will greatly exhilarate our friend, with whom we must confess a secret sympathy. Before giving the rediscovery of the locality, however, let us extract from Pursh's Journal, which was discovered among the papers of Dr. B. S. Barton by Mr. Thos. P. James, at the time acting Librarian of the American Philosophical Society in Philadelphia, which had come into possession of the Journal along with Dr. Barton's Herbarium. It was published in Philadelphia by Mr. James in 1869, and to his kindness we owe our copy. It is a "Journal of a Botanical Excursion in the northeastern parts of the States of Pennsylvania and New York, during the year 1807."

July 20.—"Mr. Geddes brought me to a deep valley about one mile from his house, where we ascended a steep very rocky hill; here large masses of rocks seem to be piled up, or tumbled over one and another in such a confused manner that it has left large chasms between them, which sometimes appear like caves; as it has a north aspect and overshadet with trees, all the rocks are covered with moss and vegetables: and I suppose this must be a very interesting place for the botanist in the spring, the walking is very precarious, as

1. [illegible]

2 — Fritz Müller writes me that in his garden
this is visited by butterflies, & this is quite

in some places large holes are hid by weeds & bushes, & every step, one is in danger of breaking a leg or falling into a gulph.—Here I found plenty of Actea spicata, chiefly with red berries, but some of the plants had beautifull white berries, looking like waxwork.—This is the Red & White Cohosh: the blue Cohosh likewise grows in plenty here. Xylosteum tartaricum is in abundance, Ptelea trifoliata, Geranium Robertianum, Lonicera glauca, with very narrow leaves, Taxus baccata or procumbens calld Ground Hemlock—Polypodium Dryopteris a species of Clematis seemingly new to me. Satyrium repens—Circæa alpina—Chrysosplenium alternifolium—Pyrola umbellata in flower—Arum triphyllum, Asplenium rhizophyllum & what I thought the most of Asplenium Scolopendrium—this fern which I don't find mentioned by any one to grow in America I allways had a notion to be here; and indeed I was quit enjoyed to find my prejudice so well founded in truth."

We wish we had space to go on. He says a page or two before that Squire Geddes lives about six miles from Onondaga Hollow, northwest.

About 1830, Mr. William Cooper discovered the station at Chittenango Falls, more than twenty miles east of Onondago, and long the only known locality of the plant in America. In 1857, it was found at Owen Sound in Canada by Prof. William Hincks, and since then by others in the parts adjacent. In March, 1866, Mr. Lewis Foote found it about five miles south east from Syracuse, on the line of the Syracuse and Binghamton Railroad. In June of the same year, Mr. J. A. Paine, Jr., visiting that region for the purpose of verifying Pursh's station, found one or two others near Mr. Foote's on the talus of limestone cliffs near Little Lake, Green Pond and White Lake. On visiting Mr. George Geddes, son of the J. Geddes of Pursh, he was informed by that gentleman that the spot where it was first discovered was nearly five miles west of Syracuse and half a mile south of his father's house, near but not on the farm, along a high ledge ("Split Rock") about a celebrated sulphur spring. Split Rock is a limestone formation; "probably one hundred and fifty feet high and over half a mile long, semicircular, with a brook at its base on whose bank is the sulphur spring." The slope beneath the cliff, Mr. Paine says, was once a station favorable for Harts-tongue, but in consequence of clearing it is to be feared that plant has perished. Mr. Paine is probably right in concluding that Nuttall's is merely a confirmation of Pursh's habitat, and that the "Canadaigua" of the traditional label, which does not now exist, was a mistake for Onondaga. Vid. Amer. Jour. Sci. & Arts. 2nd. Ser. XLI., 417; XLII., 281; May & Sept. 1866. This fern has also been found at Chiapas, Mex. [Eaton.]

In a letter to the editor Mrs. Rust announces the re-discovery of this long sought locality, as follows:

SYRACUSE, Sept., 30th, 1879.

The Syracuse Botanical Club have been fortunate again in re-discovering the station on the Geddes farm for Scolopendrium vulgare.

We have just returned from a trip there to-day. As this ravine is on private grounds, we have not felt at liberty to go there to investigate it, as many of us have long wished to do; but when Miss Geddes invited several of us out to decide on her Botrychium which I have already written to you about, B. Lunaria, I said that I had long doubted Solopendrium ever having been found there, but now I believed it had, for the lime-stone cliffs were very like those near Jamesville Green Lake. But as a violent storm set in, we could not investigate them as we wished.

Mr. Geddes told me that his father had a pressed specimen which was found there by some great English botanist in his grandfather's time, but he thought it had all been uprooted, as so many botanists had been there in pursuit of it since and had been unsuccessful in finding any. Quite a number from other places who have been to me to direct them where to find it have told me that they had been on the Geddes farm but there was none there. Then too our State Botany says that Mr. Nuttall's specimens in the herbarium of the Academy of Sciences in Philadelphia are marked "near Canandaigua at Geddes' farm, in a shady wood, with Taxus Canadensis."

The Geddes farm is not in or *near* Canandaigua, but some five miles west of us, but Scolopendrium is there with Taxus Canadensis, Camptosorus rhizophyllus, Asplenium Trichomanes, A. angustifolium and many other common ferns, as I can testify, and what astonished us most was that there seemed to be quite a good deal of it.

MARY OLIVA RUST.

§ 350. **Scolopendrium vulgare discovered in Tennessee.**—A correspondent in Tennessee sent me a collection of ferns a few weeks ago to have them properly named. I must say they were a very hard looking lot, most of them being only represented by a single pinna. I was astonished to find among them a small piece of *Scolopendrium vulgare*, but quite enough to show the character of the species. In this collection I also found *Cheilanthes Alabamensis*, Kunze; *Cheilanthes vestita*, Swartz; *Cheilanthes tomentosa*, Link; *Woodwardia angustifolia*, Smith; *Woodwardia Virginica*, Smith; *Asplenium parvulum*, Mart. & Gale; *Asplenium Bradleyi*, D.C. Eaton; *Osmunda cinnamomea*, *L*, var. *frondosa*. The other ferns were those of general distribution.

Being interested more particularly in the *Scolopendrium*, I at once communicated with Mr. Cheathem, my correspondent, to send me good specimens, and as much information about the locality as he could give me.

A few days ago I received the following graphic description from my correspondent:

"Some two miles west of the Tennessee River, and about the same south-west from our new city of South Pittsburg, one quarter of a mile beyond the last flat or level at head of cove, as you start up the mountain, in the bed of the water course, and perhaps half up the mountain, sixty feet from the branch, and as much above its level, there is a fissure in the lime-stone strata, some sixty feet long and forty feet wide, at its widest part, where the hill-side spring branch comes roaring and plunging into it. This fissure, like hundreds of others to be found all around the mountain points and coves in the rotten mountain lime-stone, seems to have been made or constantly enlarged by the action of the waters, which pass through them into the net-work of caves found more or less everywhere in this lime-stone, and make their reappearance somewhere in the valleys as Blue Spring.

This spring branch, after foaming and seething along the twenty yards of varying cascades, takes its final leap of some forty feet perpendicular, breaking into a beautiful veil of froth and spray.

Excited and attracted by the tremendous roar of the falling waters, I ventured up to the brink. I was enraptured by the wild grandeur and natural beauty of the spot. I cannot describe it, but after enjoying the scene for a time, I noticed on a ledge some ten feet below me a strange dock leaf. Though no botanist, I knew the leaf was new to me. After a while I said, "Perhaps a fern;"—but how was I to get a specimen? My only chance was a long pole and a successful twist. I succeeded, and lo! the long brown diverging stripes on the under surface of the leaves told the tale and rejoiced my heart with the fact of another new fern—new to me. In a few days I came again, provided with a rope, by which I descended and returned with an armful of plants.

The following summer I returned to get more specimens of my *Deer-Tongue*, so I took two men, had two trees cut down, making a ladder by which I reached the bottom of the sink, and secured my prizes."

Mr. Cheathem is an enthusiastic collector and a close observer. I have no doubt but what we shall hear from him again. I have asked him to send me good specimens of all the ferns he finds in this locality.

Prof. Eaton writes me on being informed of this new locality for this fern: "The Scolopendrium locality is entirely new and unexpected. Canada, Central New York and parts of Mexico are the only regions hitherto known in America for this plant.

JOHN WILLIAMSON.

LOUISVILLE, KY.

Errata.—Page 338, line 26: For *Abies alba*, read Abies nigra. The former name came in by a slip in copying. The cones of this spruce on Roan Mountain, it may here be remarked, are narrow for *A. nigra*, and the scales firmer-edged: but the tree is undoubtedly *A. nigra*. The white spruce is not known so far south by several hundred miles. Line 12: read sessilifolia. Last line: for XX. read XV.

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The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club* ***may be found at* 245 *Broadway.***

Vol. VI., No. 58.] **Bulletin of the Torrey Botanical Club.** [New York, Oct., 1879.

§ 351. Notes on the Flora of the Lake Superior Copper Region.

Probably one of the first things that will strike the eye of the botanical observer from the vicinity of New York, on his arrival in this region, will be the total absence of so many of our familiar forest trees.—*Castanea vesca*, L., var. *Americana*, Michx., is not to be found at all. The genus *Quercus* is not nearly so plentifully represented as with us and *Carya* is a rarity.

The mass of the forest is made up of *Abies Canadensis*, Michx., *Abies balsamea*, Marsh., *Pinus resinosa*, Ait., *Betula papyracea*, Ait., and a thick undergrowth of *Ostrya Virginica*, Willd., *Corylus rostrata*, Ait., and *Betula lenta*, L.

One of the most conspicuous objects along roadsides and the borders of woods, during July, is the *Rubus Nutkanus*, Moçino, with its bunches of pure white flowers. In situations a little more shaded may be found *Adenocaulon bicolor*, Hook. *Streptopus amplexifolius*, DC., *Streptopus roseus*, Michx., and a carpet of *Cornus Canadensis*, L., *Linnœa berealis*, Gronov., and *Mitchella repens*, L.

In the deepest parts of the forests, under the shade of the evergreens, the *Ericaceœ* are well represented.—*Epigæa repens*, L. ; *Gaultheria procumbens*, L. ; *Pyrola elliptica*, Nutt. ; *P. Chlorantha*, Swartz. ; *P. secunda*, L. ; *P. minor*, L. ; *Moneses uniflora*, Gray ; *Chimaphila maculata*, Pursh, ; *P. umbellata*, Nutt, ; and *Monotropa uniflora*, L., grow in abundance, especially near or on the old rotten trunks of Abies Canadensis that have fallen.—With these latter species many of the *Orchidaceœ* occur : *Habenaria Hookeri*, Torr. ; *H. orbiculata*, Torr. ; *Goodyera repens*, R. Br., ; *G. pubescens*, R. Br., ; *G. Menziesii*, Lindley, ; *Listera convallaroides*, Hook, ; *Mycrostylis ophioglossoides*, Nutt, ; *Liparis Lœselii*, Richard, and *Aplectrum hyemale*, Nutt.—Among the grasses may be noted *Brachyelytrum aristatum*, Beauv, ; *Calamagrostis Canadensis*, Beauv, ; *Glyceria Canadensis*, Trin, ; *Poa serotina*, Ehrhart, ; *Gymnostichum Hystrix*, Schreb, ; the new species, *Avena Smithii*, T. C. Porter, ; *Phalaris arundinacea*, L., and *Milium effusum*, L.

Among the Cryptogams we have : *Equisetum limosum*, L. ; *E. sylvaticum*, L. ; *E. scirpoides*, Michx. ; *Phegopteris Dryopteris*, Fée, ; *Aspidium aculeatum*, Swartz, *var. Braunii*, Koch, ; *Woodsia glabella*, R. Br. ; and *Lycopodium annotinum*, L. ; *L. clavatum*, L. ; *L. complanatum*, L. *Selaginella rupestris*, Spreng. occurs in great abundance on rocks and cliffs in company with *Asplenium Trichomanes*, L.

HOUGHTON, Mich., Aug. 1879. ARTHUR HOLLICK.

§ 352. **Diseased Lepidium.**—Along the roadsides of West Philadelphia I have lately seen two interesting diseased forms of Lepidium Virginicum which may be more common than I know. In both the stem is much thickened, knotted, and cracked, besides being somewhat woody. A little cutting shows that this is the effect of some egg-laying insect. One form seems to consist mainly in a shortening of all the branches of the herb, thickening up the top until it becomes a bush you can hardly see through, and, by bringing the pods together, giving the plant an appearance of prodigous fruitfulness. This is an appearance only as far as the number of pods on a single spike is concerned; but something more in another way; it increases the number of spikes on a branchlet, all of them fruitful. One such specimen has a stem half an inch thick at the base, one fifth of an inch thick three inches above the base, and is ten inches high. Its head, or bushy top, is about five inches in height by seven in diameter, and is one mass of filled-out pods. The leaves are generally linear, with here and there a perceptible notch, rarely as much as a quarter of an inch long, and generally not more than a tenth of an inch. Their width is about one twenty-fifth of an inch. Branches, small and scattering, spring from the base just at the ground.

The other form has also a thickened stem and minute leaves; but the fruit is generally stunted and abortive, if it has not already dropped off. The general appearance of the plant is thick and wiry, here and there a starved and flattened pod appearing along the stem among the abortive flower-remnants or the empty peduncles that have dropped their flowers. Each stem seems to keep a minute tuft of flowers at the end, to the last. Each spike before it elongates or opens, has the appearance of a minute plantain head, a little suggestive also of a young asparagus shoot. These spikes are small however, being about one sixth of an inch long by one twentieth of an inch in diameter.

They reminded me very strongly of some plants of the huckleberry tribe which I found on Long Island years ago, while Dr. Torrey was still alive, very depauperate in everything else, but the flowers and fruit preternaturally enlarged by the influence of some insect or fungus. I don't remember to what species those bushes belonged; but I brought some specimens to the Club, when Dr. Torrey took charge of them. They may be the Vaccinium which a recent communication to the BULLETIN speaks of as exhibiting the same phenomenon, or they may have been Gaylussacia. The flowers and fruit were as large as those of a moderately sized cherry.

I. H. H.

§ 353. A brief contribution to the Mycological-Flora of the United States,

By F. BARON THUEMEN.

1. **Puccinia lateripes** Berk. et Rav. in Grevillea III. p. 52.—Ad folia viva Dizygandrae strepentis Meissn. St. Louis, Mo. Leg. Eggert.

2. **Puccinia Gentianae** Lk. in Linne, Spec. plant. c. Willd. VI. 2. p. 73.—Ad folia viva Gentianae puberulae Mchx. Plymouth, Iowa. Leg. E. Jones.

3. **Aecidium Hamiltoniae** Thuem. *nov. spec.*—Aec. caespitibus hypophyllis, rarissime amphigenis, sparsis, irregularibus, in foliorum pagina superiore maculam ferrugineam formans; pseudoperidiis densis, dilute flavidis, parvis, cupulaeformibus, ore crenulato, tenui; sporis polyedris vel irregulariter ovoideis, dilute flavescentibus vel achrois, episporo reticulato punctulatoque, tenui, 30–40 mm. long., 16–22 mm. crass.

In Hamiltoniae umbellatae Spr. (Comandrae umbellatae Nutt.) foliis vivis, St. Louis, Mo. Leg. Eggert.

4. **Coleosporium ochraceum** Bon. Spec. Coniomycet., p. 20.—Ad Agrimoniae parviflorae Ait. folia viva. St. Louis, Mo. Leg. Eggert.

5. **Coleosporium Solidaginis** Thuem. in Torrey Botan. Club Bulletin VI. p. 216.—In foliis vivis Solidaginis sempervirentis Lin. St. Louis, Mo. Leg. Engelmann.

6. **Phyllosticta cruenta,** Kickx. Rech. Fl. mycol. Flandre IV, p. 22—Ad Polygonati racemosi Monch. folia languida. St. Louis, Mo. Leg. Eggert.

7. **Phyllosticta cornicola,** Rabh. in Klotzsch, Herb. mycol. Ser. I. No. 454.—In Corni sericei L'Herit. foliis vivis. Grinnell, Iowa. Leg. E. Jones.

8. **Septoria Pileae,** Thuem. *nov spec.*—S. peritheciis epiphyllis, sparsis vel solitariis, mediis, hemisphaerico-applanatis, subemersis, nigris in macula irregularia, arescendo sordide ochro-grisea, latissime fusco-olivaceo cincta, subtus concolori ; sporis bacillaribus, minime arcuatulis, continuis, utrinque acutatis, hyalinis, 22–24 mm. long., 1.5–2 mm. crass.—A Septoria Urticae Desm. valde differt sporis duplo brevioribus, continuis, anucleatis.

Ad Pileae pumilae Gray folia viva. St. Louis, Mo. Leg. Eggert.

§ 354. **Fern Etchings.** By JOHN WILLIAMSON, author of "Ferns of Kentucky," Louisville, Ky. John P. Morton & Co., Publishers.

The title of this handsome book does not sufficiently indicate its true character, as, by adopting the geographical range of Gray's Manual for its basis, and accompanying his plates with concise descriptions, the author has really given us a valuable, and to the amateur collector an indispensable hand-book of the ferns—with the single exception of *Adiantum Capillus-Veneris*, the recent discovery of which in Virginia was known too late for insertion—in the Northern, Middle and Eastern States.

The Plates are bona-fide etchings, printed directly from the original copper plates, and show a marked superiority over the lithographic transfers in the author's previous work.

The drawings are life-like and beautiful. The author has instinctively caught the very life and spirit of the ferns themselves, and reproduced them so naturally that they almost seem to live and grow.

The texture of the different species is admirably expressed, that of *Trichomanes radicans*, *Dicksonia*, and *Aspidium Lonchitis* being especially finely indicated. The smaller species furnish excellent examples of the author's artistic ability, while some of the larger ones show a positive genius for representing a mere section of a huge fern in such a manner as to convey an accurate idea of the character of the whole.

The plates are perhaps as well printed as could be expected from one inexperienced in the niceties of art required for this kind of work, but the clear and handsome manner in which some of them are executed makes the careless handling which has seriously marred the beauty of others all the more to be regretted, and it would have been better if the numbers at the top could have been placed elsewhere, or left off altogether.

The descriptions, with two or three exceptions, are those of Prof. Eaton, taken either from "Gray's Manual" or "Ferns of North America," and in that eminent author's usual clear style.

The text is almost wholly free from typographical errors, that which gives the dimensions of Schizæa in feet instead of inches being the only one noticed, and serving to call to mind a similar error in Gray's Manual where the dimensions of *Solidago altissima* is given in inches instead of feet, a typographical error so plain that one would suppose any intelligent botanist would so understand it without any explanation, yet a recent writer has seriously assumed that Prof. Gray was in error in representing that plant as only growing seven inches high!

Altogether the present work is a most creditable addition to our fern literature, and should be in the hands of all Pteridologists and Pteridophils. G. E. D.

§ 355. **Trapa natans.**—I found this plant growing in Fresh Pond, Cambridge, Mass., several years ago, and, though it puzzled me at first, I soon traced it to the Botanical Garden and to Mr. Louis Guerineau, then gardner, who had thrown the seeds into this and other ponds. Later I carried seeds of it, and plants of *Marsilia quadrifolia* which had also been placed in the pond by Mr. Guerineau, to my friend Minor Pratt, of Concord, Mass., and very well remember our placing both seeds and plants in a pond near Sudbury River. Afterwards I think Mr. Pratt distributed more of them, and I suspect that the plant of *Trapa natans*, mentioned in the July *Bulletin* as having been taken from a pond in Concord, originated from seeds thus distributed either by Mr. Pratt or myself.

I have several times had plants of *Trapa natans* that were collected in the vicinity of Boston, during the present year, brought to me for identification, and I have never entertained a doubt as to the manner of its introduction into waters outside of the Cambridge Botanic Garden. But that so fine a plant as this, with its handsome leafy rosettes, and edible nuts, which would, if common, be as attractive to boys as hickory nuts now are, can ever become a "nuisance" I can scarcely believe. GEO. E. DAVENPORT.

Boston, Oct., 1879.

§ 356. **Utricularia resupinata,** Greene.—The limits of this species in Gray's Manual confine it to "sandy margins of ponds, East Maine to Rhode Island." That Mr. Miller should find it in similar situations in Suffolk Co., is not strange; but now Mrs. Charles Barnes, of the Syracuse Botanical Club, has found it in the North Woods, Fenton's, No. 4, Lewis Co., New York, Aug., 1879, on the marshy shores of a lake, as we are informed. Mrs. Barnes has already made "Fenton's, No. 4" noted for *Bytrychium simplex*, vid. Davenport's monograph.

§ 357. **Gray's Botanical Text Book. Structural Botany.**—A second issue from the stereotype plates of this work, bearing the date of 1880, appeared in October. In it such typographical corrections have been made as had been indicated to the author, and two or three small alterations. The author solicits further corrections, typographical and other.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club.* 25 *cents. Address,* WM. H. LEGGETT, 54, *East* 81*st Street, New York. Money Orders on* Station K. *N. Y. All subscriptions or orders filled only on receipt of the money.*
The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club may be found at* 245 *Broadway.*

Vol. VI., No. 59.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, Nov. 1879.

§ 358. Ballast Plants in New York City and its vicinity.

In the BULLETIN for Sept. and Nov., 1878, a list was given of ballast plants found last year at Hunter's Point and near Communipaw Ferry.

During the past season further collections have been made at those places and at other stations where ballast has been used for filling. Never before, probably, has so much been brought to this country during the same period as in the past two years. The continued large balance of trade in favor of the United States, during this time, has compelled a great many vessels, for want of freights on their westward trips from Europe, to come more or less laden with ballast. At the Atlantic Docks, Brooklyn, and on Gowanus Creek, vessels have for many months past been discharging it without cessation, night and day. A large part of it has been dumped upon sunken lots in the vicinity; much of the rest, laden upon scows, has been taken to New York city and used in building up new streets on the low grounds in the vicinity of Harlem River.

Eighth Avenue, in 1877–1878, was thus filled in from its northern terminus, where it strikes Harlem River, down to about 140th street, a distance of more than half a mile, with an average filling of from 7 to 10 feet; 107th Street, from Third to Fifth Avenue, and 102d Street, east of Second Avenue, were also thus filled a year or two since; and 100th Street, east of Second Avenue, is now filling in a similar manner. In September last, when all these stations, except the 8th Ave. one, first became known to me, abundant evidence of ballast plants were still manifest at all of them except 100th Street, where the work of filling is still in progress. Other streets and low grounds will doubtless be found thus planted, if the sides of the filled-in streets are observed, and ballast plants looked for. *Diplotaxis tenuifolia*, with its long, nearly naked flowering stems, and large, pinnately lobed lower leaves, I have found to be an almost invariable index of ballast ground. *Atriplex rosea*, *Verbena officinalis* and *Mercurialis annua* are almost equally certain attendants. Where any of these are observed, further search is almost sure to be rewarded by many other foreign species.

Near the last of September, on returning from Snake Hill, the blossoms of Diplotaxis along the Rail Road track, near Hoboken, led to the recognition of ballast filling for the space of about a third of a mile, commencing half a mile west of the Hoboken Depot. Late as the season was, several things not elsewhere observed were found there, such as Anchusa, Pulicaria, Conyza, Carduus nutans, Rumex maritimus, besides others common to all the stations. In the fields near by, Diplotaxis tenuifolia and Rumex maritimus were very abundant and vigorous.

The station at 8th Avenue was first mentioned to me in July last, by the late Mr. Ruger, with whom, shortly before his death, I visited the grounds and found a rich harvest of introduced plants upon both slopes of the filled-in Avenue. The same region was visited by some members of the Club in 1878, but I have not learned that any record of their collections is preserved. A large portion of the list given below was found at that station.

At Communipaw Ferry, the site of last year's principal collections, the Rail Road Company has been very busy during the summer with improvements on the grounds lying near the track and within half a mile of the Ferry House, filling in some two or three feet above the former grade, and thus exterminating several species that had obtained a firm foothold there; among them *Lepidium Draba* and *Neslia paniculata*, which I have not found elsewhere. A number of species collected there in October, as stated below, are evidently from the recent filling. On an abandoned wharf near the Ferry, where last year's ballast lay undisturbed, some thirty foreign species were found. In the list given below none of the species reported last year are repeated; all of them, however, were found in the same localities, except Lepidium Draba, Rapistrum, Neslia, Portulaca, Gossypium, Coronilla, Arachis, Sida, Epilobium, Hypochaeris, Cichorium, Verbascum, Tencrium, Ervum, Flaveria and Leptochloa; and of these, Rapistrum, Sida, Epilobium and Hypochaeris have been found at one or more of the other stations; the others that were reported " abundant " last year are equally so this year at the same places, and their continuance is probable unless exterminated by " improvements."

At Hunter's Point, the spot where *Flaveria Contrayerba* grew abundantly last year, and, in fact, nearly the whole enclosure, was afterwards covered with new ballast. The Flaveria was destroyed, but from the new deposit has sprung a large number of the species found at the other stations. Most of the plants in the list, it will be observed, have been found at several of the different grounds; but at each station a few have been found not observed elsewhere. English and Norwegian vessels have brought the great bulk of all the ballast, but not from England or Norway chiefly. These vessels are largely carriers from other countries, and enquiry usually elicited no information as to the actual origin of the ballast so certain as that derived from the plants themselves. The species found are mainly natives of Britain, Germany and the Mediterranean region; a few belong to the West Indies and to Central and South America, and one to the Cape of Good Hope.

Neither the slopes of the filled-in streets, nor the dumping grounds now in use in this vicinity can afford any permanent lodgment to many of these waifs from abroad, nor are the localities such as to offer many of the plants an easy escape to congenial soil. While most of them will therefore perish after a few seasons, sufficient opportunity will nevertheless be afforded to some, not hitherto reported here, to test their endurance of our climate and to compete with our native growths. The less hardy plants will be ejected by our vigorous weeds; but Atriplex rosea, A. laciniata and Diplotaxis tenuifolia, and doubtless others, will maintain their ground. In the annexed list, Hunter's Point is indicated by " H. Pt.," Communipaw by "Com.," Gowanus by " Gow.," Eighth Avenue by " 8th Ave.," and Hoboken by " Hob."

The species marked by an asterisk (*) are not in the BULLETIN Catalogue; those printed in italics, though previously found more or less elsewhere, are not in Gray's Manual; and those in capitals have not to my knowledge been previously reported as growing wild in this country.

The analysis of many of these unfamiliar plants has been puzzling; some thistles and others, chiefly Compositae, still undetermined, are omitted; about half of the list, embracing nearly all about which any doubt was entertained, have been submitted to Dr. Gray and Prof. Watson, who have kindly corrected errors and supplied deficiencies in naming. Where not otherwise stated the plants are European. The numbers are continued from the former published lists, and only those plants have been included which have undoubtedly sprung from seeds introduced with ballast. Of those called "scarce" only from two to four specimens were found.

69. *_Ranunculus philonotis_, Ehr.—8th Ave. June. Scarce.
70. Papaver dubium, L.—H. Pt. June, July. "
71. P. somniferum, L.— " " " "
72. *Glaucium luteum, Scop.—Com., 8th Ave. June—Sept. Abundant.
73. Nasturtium palustre, DC., _var._ hispidum, DC.—Gow. Sept. Scarce. J. Schrenk.
74. N. sylvestre, R. Br.—8th Ave. July—Sept.
75. *_Diplotaxis tenuifolia_, DC.—common in all our ballast grounds. A different form, not identified as a different species, was also found at H. Pt. and 107th St., of smaller size, with leaves mostly at the base, entire, or slightly toothed, and with shorter petals and pedicels, probably var. _integrifolia_, Koch.
76. *_Brassica monensis_, Huds.—Hob. Oct. Scarce.
77. *ERYSIMUM ORIENTALE, L.—H. Pt., 8th Ave. July. Scarce.
78. *Alyssum calycinum, L.—Com. May. Scarce.
79. *_A. incanum_, R. Br.—8th Ave. Aug. Scarce.
80. *IBERIS UMBELLATA, L.—Com. July. J. Schrenk. 1 plant.
81. Draba verna, L.—H. Pt. June.
82. *LEPIDIUM GRAMINIFOLIUM, L.—Com , Hob. Aug.—Oct.
83. *Senebiera Coronopus, Poir.—8th Ave., Com. June—Sept. Abundant.
84. S. didyma, Pers.—H. Pt., Com. June—Sept. Abundant.
85. _Cakile maritima_, Scop.—Com., Gow. June—Sept. Abundant.
86. Reseda luteola, L.—H. Pt., Com., 8th Ave. June—Aug ; with R. lutea ; both abundant at 8th Ave.
87. R. odorata, L.—Com., H. Pt. June—Sept.
88. *_R. alba_, L.—Gow. Sept. A few specimens in fruit only.
89. *R. PHYTEUMA, L.—H. Pt., 8th Ave. July. Scarce.
90. *_Frankenia pulverulenta_, L.—Com. July. Scarce.
91. *_Lychnis chalcedonica_, L.—Com. July. Scarce.
92. *CERASTIUM TETRANDRUM, Curtis.—Com. Aug. Scarce.
93. *SILENE ANGLICA, L.—Com. Sept.—Oct. This may be _S. Gallica_, L., I cannot distinguish between the two, if different (?) Petals notched, ripe capsules mostly erect.
94. Silene noctiflora, L.—H. Pt. July—Aug. Scarce.
95. Linum usitatissimum, L.—Com., H. Pt. July—Sept.
96. *HYPERICUM HUMIFUSUM, L.—H. Pt. Aug.—Sept.
97. Malva sylvestris, L.—8th Ave. June—July.

98. *ALTHAEA HIRSUTA, L.—8th Ave. July.
99. **Sida rhombifolia*, L.—Com. Aug. Soon buried up. Southern.
100. Hibiscus Trionum, L.—Com. Sept. Scarce.
101. *GERANIUM ROTUNDIFOLIUM, L.—Com., H. Pt. July—Sept.
102. Geranium pusillum, L.—Com., H. Pt. July—Sept.
103. Erodium cicutarium, L'Her.—Common. May—Sept.
104. **Erodium moschatum*, L'Her.—Com. Oct. But without any odor of musk; reported this season at Phila., by Mr. Martindale.
105. *ULEX NANUS, Forster.—Com. Oct.; not in flower.
106. *ONONIS ARVENSIS, L.—8th Ave. Aug.—Sept. Scarce.
107. **Trigonella monspeliaca*, L.—8th Ave. June. Scarce.
108. *Cassia occidentalis, L.—Com. Aug. 1 plant only, soon destroyed. Southern.
109. *MELILOTUS ARVENSIS, Wallroth.—Com. July.
110. **Melilotus parviflora*, Dsf.—Com. Aug.—Oct.
111. *MELILOTUS GRACILIS, DC.—Com. Aug.—Oct.
112. Medicago sativa, L.—8th Ave. June.
113. Medicago maculata, Willd.—Com. June—Aug. Leaves only
114. **Medicago denticulata*, Willd.—H. Pt. Aug. Scarce.
115. *MEDICAGO APICULATA, Willd.—H. Pt. Aug. Scarce.
116. *TRIFOLIUM INCARNATUM, L.—8th Ave. July. Scarce.
117. *TRIFOLIUM ELEGANS, Rchb.—Com. Aug. Scarce.
118. **Trifolium hybridum*, L.—8th Ave. Sept. J. Schrenk.
119. Trifolium procumbens, L.—H. Pt., Com. June—Aug.
120. Trifolium minus, Smith.—H. Pt. Sept. Scarce.
121. **Lotus corniculatus*, L.—8th Ave., H. Pt. July—Sept. Abundant.
122. **Tribulus terrestris*, L.—H. Pt., Com. June—Sept. Several plants.
123. Vicia Cracca, L.—Com. Aug., with V. sativa.
124. Vicia hirsuta, Koch.—Com. Aug.—Oct., with V. tetrasperma.
125. *VICIA GRANDIFLORA, Scop.—8th Ave. July. Scarce.
126. *VICIA NARBONENSIS, L.—8th Ave. July. Scarce.
127. *VICIA PEREGRINA, L.—8th Ave. July, 1878. Scarce. King.
128. **Lathyrus Aphaca*, L.—Com. 8th Ave. June—July.
129. *LATHYRUS SATIVUS, L.—Com. Oct. 1 plant only.
130. Potentilla anserina, L.—Com. June—July.
131. *EPILOBIUM PARVIFLORUM, Schrb.—H. Pt. Aug. With E. hirsutum. Gow. Sept. Scarce.
132. **Ecballium agreste*, Rchb—H. Pt. Com. July—Sept.
133. Sicyos angulatus, L.—8th Ave. Aug.
134. Aethusa Cynapium, L.—8th Ave., H. Pt. July—Sept.
135. Galium verum, L.—Com. June. N. L. Britton.
136. *GALIUM TRICORNE, With.—Com., 8th Ave., H. Pt. June—Aug.
137. *EUPATORIUM CANNABINUM, L.—Gow., 8th Ave. Aug.—Sept.
138. *ASTER TRIPOLIUM, L.—8th Ave. July—Sept. (The only English Aster.)
139. *CONYZA ALBIDA, Less.—Hob. Sept.—Oct. Abundant. South America or W. Indies, (Erigeron albidum.)
140. *Bellis perennis*, L.—H. Pt. Sept. One specimen.
141. *INULA DYSENTERICA, L.—Hob. Oct. Scarce.

142. *Inula Pulicaria, L.—Hob. Oct. 2 plants only.
143. *Filago arvensis, L.—H. Pt. July—Aug.
144. Gnaphalium uliginosum, L.—H. Pt. June—Oct.
145. *Gnaphalium luteo-album, L.—8th Ave. July. Scarce.
146. Xanthium spinosum, L.—H. Pt. Aug.—Sept.
147. *_Acanthospermum xanthioides_, DC.—8th Ave. Sept. Southern. N. L. Britton.
148. *Bidens triparta, L.—H. Pt. July. Scarce.
149. *_Bidens leucantha_, Willd.—Com. Oct. Cal. J. Schrenk.
150. *_Hemizonia pungens_, Torr. & Gray.—H. Pt. July. Cal. 1 plant only.
151. *_Chrysanthemum segetum_, L.—8th Ave. July—Sept.
152. *Chrysanthemum Parthenium, Pers. "
153. Artemisia vulgaris, L.—Com. Aug.—Sept.
154. *Cenia turbinata, Pers.—(Cotula turbinata, L.,)—Com. Oct. Cape of Good Hope. Scarce. Identified by Dr Gray. A low decumbent plant with fine inodorous foliage—heads 6″; rays 1″, white above, pink beneath; peduncle, beneath the receptacle, enlarged, hollow, (kenos), and turbinate; rays with 2–3 lobed lip at the base of the interior surface: interior florets regular and 4 lobed.
155. Senecio vulgaris, L.—Common. July—Sept.
156. *Carduus nutans, L.—Hob. Oct.
157. *_Carduus pycnocephalus_, Jacq.—8th Ave., H. Pt. June—July.
158. *Carduus marianus, L.—8th Ave. July—Sept.
159. *Cirsium arvense, Scop. _var. integrifolium_, Koch.—8th Ave. July.
160. Centaurea Cyanus, L.—8th Ave. July.
161. *Centaurea Jacea, L.(?)—Com. With appendages broad, concave, mucronate, mostly entire, scarious, dark brown in the centre. Scarce. July—Oct. J. Schrenk.
162. *Centaurea aspera, L.—H. Pt. Sept. Scarce.
163. *_Centaurea solstitialis_, L.—Com. Aug. J. Schrenk.
164. *Centaurea Calcitrapa, L.—H. Pt., 8th Ave. Aug.—Sept.
165. *_Helminthia echioides_, Gärtn.—H. Pt., 8th Ave. July—Sept.
166. *Leontodon autumnale, L.—8th Ave. Aug.—Sept.
167. *_Leontodon_ (_Thrincia_) _hirtum_, L.—8th Ave., H. Pt. Aug.—Sept.
168. *Leontodon hispidum, L. (?)—H. Pt. Aug. Scarce.
169. *Leontodon pratense, Koch. " " "
170. *_Crepis virens_, Vill.—8th Ave., H. Pt., Hob. July—Oct.
171. *_Crepis tectorum_, L.—H. Pt. Aug.—Sept.
172. *_Hieracium_ —(?)—8th Ave. July. J. Schrenk.
173. *Lactuca Scariola, L.—Com. Aug. Scarce.
174. *Sonchus tenerrimus, L.—Com. Oct. Scarce.
175. *Jasione montana, L.—8th Ave., H. Pt. Aug.—Oct. Flowers blue, in globular heads, like Scabius.
176. *_Specularia Speculum_, DC.—Com. June. Scarce.
177. *_Heliotropium Peruvianum_, Don.—8th Ave., H. Pt. June—Sept.
178. Heliotropium Europaeum, L.—Com., 8th Ave., H. Pt. July—Oct.. Abundant.

179. Lycopsis arvensis, L.—H. Pt. June—Sept.
180. *ANCHUSA OFFICINALIS, Don.—Hob. Sept.—Oct.
181. *ANCHUSA LEPTOPHYLLA, R.& S. (?) Com. Oct. (Hairs closely appressed and soft ; may be Echinospermum young.)
182. *ECHIUM VIOLACEUM L.—Com., 1st Ave. July—Sept. The stamens exceed the corolla; but the narrow root leaves and pungent, tubercled hairs of the foliage belong to E. violaceum, rather than to E. plantagineum L.
183. *Ipomoea Nil, Roth.—8th Ave. Oct. J. Schrenk.
184. *_Solanum miniatum_, Bernh.—8th Ave., Hob. Aug.—Oct. (Berries red.)
185. *_Solanum rostratum_, Dunal.—8th Ave. Sept. Western. Dr. Koehler.
186. Nicandra physaloides, Gaert.—H. Pt., Com. Aug.
187. Hyoscyamus niger, L.—Com., 8th Ave., H. Pt. May—Sept.
188. *_Petunia parviflora_, Juss.—H. Pt. Aug.—Oct. Scarce.
189. *_Linaria supina_, Desf.—Gow. Sept. J. Schrenk.
190. *LINARIA STRIATA,, DC. (L. repens, Ait.)—Com. July. Scarce.
191. *Linaria Elatine, Mill.—Com., H. Pt. July—Aug.
192. *Antirrhinum majus, L.—H. Pt. July—Sept.
193. *Antirrhinum Orontium, L.—Com. July—Oct. Scarce.
194. *_Scrophularia aquatica_, L.—Gow., 8th Ave., H. Pt. Aug.
195. *_Scrophularia canina_, L.—Com. Sept. Scarce. J. Schrenk.
196. Veronica Anagallis, L.—Gow., 8th Ave. Aug.—Sept.
197. *VERONICA BECCABUNGA, L.—Gow. Sept. (Type.)
198. Veronica arvensis, L.—H. Pt. Aug.
199. Veronica agrestis, L.—Com., H. Pt. July—Sept.
200. *Veronica Buxbaumii, Ten.—H. Pt., 8th Ave. June—Aug.
201. *_Sesamum Indicum_, L.—Com. Aug. Soon buried up.
202. *_Verbena bracteosa_, Michx.—H. Pt. Aug. Western.
203. *Mentha arvensis, L.—H. Pt., Gow., with M. aquatica.
204. *Lycopus Europaeus, L.—Gow., 8th Ave. July—Sept. (Type.)
205. *Satureia hortensis, Tourn.—8th Ave., Aug.
206. *SATUREIA MONTANA, L.—8th Ave. Aug. J. Schrenk.
207. *Ballota nigra, L.—Gow. Sept.
208. *_Leonurus Sibericus_, L.—Com. Aug. 1 plant only.
209. Lamium amplexicaule, L.—Com., H. Pt. May—June.
210. *Lamium purpureum, L.—H. Pt. June.
211. *Lamium album, L.—H. Pt., 8th Ave. July—Oct.
212. Galeopsis Ladanum, L.—8th Ave. June—Sept. 1 plant only.
213. *Stachys arvensis, L.—H. Pt., Com., 8th Ave., Hob. July, with S. annua.
214. *_Stachys sylvatica_, L.—H. Pt., Gow. July—Oct.
215. *Stachys palustris, L.—8th. Ave. July—Sept. (Type.)
216. *Amarantus sanguineus, L.—8th Ave. Sept.
217. Amarantus deflexus, L. (A prostratus, Balb.)—H. Pt., Com. Sept.
218. *_Amarantus crispus_, Braun.—Streets, Gow: Aug.—Oct.
219. *_Chenopodium Vulvaria_, L.—H. Pt., Com. Ruger.
220. *Chenopodium polyspermum, L.—H. Pt., Com. July—Sept.
221. Chenopodium murale, L. (?) H. Pt., Com. July.

222. Blitum capitatum, L.—8th Ave. July. Ruger.

223. Atriplex patula, L. *var. angustifolia* (sp. Sm.) prostrate. H. Pt.

224. *ATRIPLEX HORTENSIS, L.—Gow. Sept. J. Schrenk.

225. *ATRIPLEX LACINIATA, L.—At 8th Ave., and Hob. only, with *A. rosea*, June—Oct. Gathered last year at Philadelphia, and distributed under the name of *A. rosea*, from which however it strikingly differs in its long (3′—10′) terminal spikes of (mostly) infertile flowers, and in its more deeply sinuate and often pointed leaves, and in its less spreading and less rigid branches. *A. rosea*, precisely answering to the description in the appendix to Gray's Manual, is very common in all our ballast grounds. Its form is everywhere the same—terminal spikes of less than 1′, and with rhomboidal leaves, merely sinnate toothed, with very spreading, rigid branches. The confusion about these two species in some of the books could not, I think, arise with our specimens in view

226. *BETA MARITIMA, L.—8th Ave. Sept.—Oct. Spikes prostrate.

227. *Polygonum lapathifolium, L.—8th Ave., H. Pt. July—Sept., nearly glandless, leaves marked by a large (6″) jet black spot, more vivid and sharply defined than in P. Persicaria. Also *var.* incanum (spec. Koch.) H. Pt. J. Schrenk.

228. Polygonum Convolvulus, L.—Com., 8th Ave. Aug.

229. *Rumex Patientia, L.—Com. July.

230. *Rumex maritimus, L.—Hob. Oct. Abundant and spreading.

231. *Urtica urens, L.—H. Pt., Com. June—Aug.

232. Urtica dioica, L.—H. Pt.

233. *PARIETARIA OFFICINALIS, L.—Com., Gow. July—Sept.

234. **Ricinus communis*, L.—Com. Sept.—Oct. Flowers. 20 plants. Southern.

235. **Euphorbia Peplis*, L.—Com. Aug. Scarce.

236. *Euphorbia helioscopia, L.—H. Pt. June.

237. *Euphorbia platyphyllos, L.—Com. Aug. 1 plant.

238. *EUPHORBIA PEPLUS, L.—8th Ave. Abundant.

239. *EUPHORBIA EXIGUA, L.—8th Ave. July. Scarce.

240. *ANTHERICUM RAMOSUM, L(?)—Com. Oct.

241. *ALOPECURUS AGRESTIS, L.—8th Ave. July. Ruger. [Also Com.]

242. *Agrostis Spica-venti*, L.—8th Ave. June. Ruger.

243. Eragrostis Purshii, Schr.—H. Pt., with E. poaeoides *var.* megastachya.

244. Dactylis glomerata, L.—8th Ave. July.

245. Festuca ovina, L:—Com. June.

246. Bromus racemosus, L.—8th Ave. Com. July—Sept.

247. Bromus mollis, L.—Com. May.

248. Bromus sterilis, L.—Com: June.

249. Lolium perenne, L.—H. Pt., 8th Ave. July—Oct.

250. Aira caryophyllea, L.—H. Pt. Oct. Leggett.

251. Holcus lanatus, L.—8th Ave. July.

252. Phalaris Canariensis, L.—Com. May—July.

253. CORYNEPHORUS CANESCENS, Beauv.—Hob. Oct. J. Schrenk.

254. Glyceria distans, Wahl.—Com. July. J. Schrenk.

255. *Hierochloa australis*, K. & S.—Com. "

256. *Panicum miliaceum.*—Com. 8th Ave. July.

257. Setaria verticillata, S. glauca and S. viridis. H. Pt., with Crypsis schoenoides, Lam.

258. *Tragus racemosus*, Desf. (Lappago recemosa, Schreb; Cenchrus racemosus, L.)—8th Ave., 1878, King. Reported also at Philadelphia by Mr. Martindale.

Nov. 1st 1879. ADDISON BROWN.

§ 359. New or Little-known Ferns of the United States, No. 7.

21. **Pellæa andromedæfolia**, var. **rubens**:—Upper surface of pinnules and the involucres deep red, otherwise like the type.

This beautiful variation of a well-known Californian fern has been sent to me several times by Mrs. Cooper, who has not stated the exact locality where it was found, but it was probably not far from Santa Barbara. In the dried specimens the color is a dark blood-red, but in the living plant the color must be much brighter. Young fronds of *Adiantum macrophyllum* and *Blechnum serrulatnm*, and of a few other ferns are often very prettily tinged with red. *Polypodium appendiculatum* of Klotzsch has the rachis and veins colored bright red; but I do not know of any other fern besides the one here described which has the whole upper surface red in the mature frond. The rachises are colored, but less vividly than the pinnules.

22. **Aspidium Oreopteris**, Swartz.—"Caudex short, erect or decumbent, copiously scaly: stipites short, tufted, scaly below: fronds 1½—2 feet long, firm-membranaceous, broad-lanceolate, gradually tapering and attenuated below, glandular; pinnæ two to three inches long, patent, sessile, from a broad base lanceolate-acuminate, deeply (more than half way down) pinnatifid, from near the middle of the frond gradually becoming shorter downward, more distant and deltoid, the lowest less than an inch long; segments plane, nearly entire, oblong, very obtuse; veins simple or forked: sori quite marginal; involucres very delicate, membranaceous, more or less toothed at the margin, soon obsolete; rachis often subulato-squamose; costæ pubescent."—HOOKER, *British Ferns*, t. 14.

Hab.—Unalaska, collected in 1878 by Mr. S. M. Turner, who sent with it this note: "Abundant enough; grows four feet high in patches of many yards square, in the ravines and wet places." This fern has been attributed to America on the strength of a frond of unknown origin found in the herbarium of Mr. Dawson Turner, and of another in the collection of Rev. W. A. Leighton, said to be from Vermont. The present specimens consist of five tronds, evidently selected beause they were smaller than most of those seen in Unalaska, being only about fifteen inches long. One of them is so young as to retain the indusium. There can be no doubt of the origin of the specimens, or that they are true A. Oreopteris. The species is common in Europe, from Lapland to Spain and Madeira in the west to Lithuania and the Polish provinces in the east. It has also been collected in Asia Minor, but is unknown throughout Siberia. Mr. Turner's other Unalaska Ferns are *Polypodium vulgare*, *Adiantum pedatum*, *Cryptogramme acrostichoides*, *Phegopteris polypodioides*, *Ph.*

Dryopteris, *Aspidium Lonchitis*, *Cystopteris fragilis*, *Botrychium Lunaria*, *Botr. ternatum*, the typical form, and *Ophioglossum vulgatum*. I am indebted to Dr. J. Schenck, of Mt. Carmel, Illinois, for an opportunity to examine them. Unfortunately it is now too late to have this fern figured in the "Ferns of North America."

23. **Aspidium mohrioides,** Bory,—hitherto known only from Chile, Patagonia and the neighboring islands, has been discovered near Mt. Shasta, California, by Mr. Lemmon. It belongs to the section *Polystichum*, having an entire orbicular indusium. The fronds are very chaffy, a span to a foot long, linear lanceolate, pinnate; the pinnæ crowded and often imbricated, pinnately lobed, the lobes crenate or crenately toothed, but never aristate or aculeate as in *A. aculeatum*, *munitum*, *acrostichoides*, etc. It will be figured in the last part of the "Ferns of North America." D. C. EATON.

§ 360. **Schizæa pusilla,** Pursh.—Specimens of this fern exist in the Newfoundland collection of De la Pylaie, but it has been commonly supposed that they must have come from New Jersey. Miss Elizabeth G. Knight, of New York, has made a discovery which goes far to make it probable that the Newfoundland habitat is not a mistake after all; for last August she collected small but fertile and unmistakable specimens of this fern on the shore of Grand Lake, about twenty-three miles from Halifax, Nova Scotia. The specimens have fertile fronds an inch and a half high, the fruit not fully matured. The plants are not abundant; they grow in company with *Lycopodium inundatum* and *Littorella lacustris*, Linn., among the rhizomes of *Osmunda regalis*. *Schizæa pusilla* has proved perfectly hardy in a little artificial bog in my garden in New Haven, and is now to be sought for with renewed scrutiny all along the coast from Long Island to Newfoundland.

The *Littorella* is, I believe, new to America. It is a little plant having a tuft of a few grass-like leaves an inch or two long, long-pedicelled solitary monopetalous staminate flowers with exserted anthers, and sessile apetalous pistillate flowers in the axils of the leaves, enclosing a one-ovuled ovary and a long and slender style. The monœcious inflorescence and solitary seed separate it generically from *Plantago*. Miss Knight is to be congratulated on her double discovery. Lake Champlain, Pringle. EDS. D. C. E.

§ 361. **A new Hawaiian Fern.—Aspidium** (Cyrtomium) **Boydiæ:** —Pusillum, cæspitosum: frondibus subspithameis chartaceis glabris, simpliciter pinnatis; pinnis 8–9 lin. longis 2—2½ latis lanceolatis crenatis obtusiusculis basi latere inferiore cuneatis superiore paullo dilatatis vix auriculatis, terminali incisa maxima; venulis pellucidis unicam Cyrtomii arcuum seriem formantibus cæterum liberis; soris a margine remotis magnis; indusiis orbicularibus lævibus margine crenulatis centro depresso affixis, sporangiis annulo 15–16—articulato donatis.

Valleys of Oahu, 80–100 feet above the sea, collected by Miss E. S. Boyd, a lady who has taken a great interest in Hawaiian Ferns. This is many times smaller than *A. falcatum*, which is also found in the Hawaiian Islands, and it also differs from that species in having but a single row of areoles along each side of the midvein. The

specimens are devoid of chaff, possibly through age. The indusia are large and firm, irregularly orbicular, and much depressed in the middle.
D. C. E.

§ 362. **A few Plants of the North Woods.**—During the month of August, I spent two weeks on Beaver lake, Watson, No. 4, Lewis Co., N. Y. It lies 18 miles east of Lowville, the point of departure from the Black River R. R., and 6 miles deep in the woods. Beaver River flows into the upper end of the lake, and takes its departure again from the lower end, the expanse between occupying about 2 miles and being about one mile wide. In the same neighborhood are numerous smaller lakes, a beaver dam, and several beaver meadows. Earlier in the season this should be an excellent region for botanizing, but in the latter part of August the drought had parched the entire under growth of the woods and clearings, so that it was only by the waterside that one could find plants in blossom. It was in this locality that Mrs. Barnes, of Syracuse, discovered that abundance of *Botrychium simplex*, which furnished Mr. Davenport with much of the material for his monograph. Unfortunately I was just a month too late for this rarity. But there were other things of quite as much interest and scarcity, particularly for this State. To begin with the lake; there were three white water lilies, *Nymphaea odorata*, Ait., the var. *minor*, Sims, and *N. tuberosa*, Paine. Much rarer, however, than either of these was *Nuphur luteum*, var. *pumilum*, Gray, which grows here in great profusion. Another scarce plant which is found in the lake is *Myriophyllum tenellum*, Bigelow, the stems of which often grow 18 inches long. Besides these, the bays are filled with *Brasenia peltata*, Pursh, and *Limnanthemum lacunosum*, Grisebach. The shores are frequently lined with *Eriocaulon septangulare*, Withering, and on the muddy margin of one of the bays grows that singular and delicate little plant *Ultricularia resupinata*, Greene. I do not remember to have seen this reported from any point in the interior of the State, nor am I aware of any other locality for it within our borders save the one reported by Mr. E. S. Miller on Long Island. *Utricularia intermedia*, Hayne, also grows in the sphagnum bogs. In a large bay on Francis Lake, about a mile east from Beaver Lake, we found the water filled with the interesting *Utricularia purpurea*, Walter, which is also reported by Mr. Miller as a native of Wading River, but for which I have heard of no locality in the central part of the State. Another *Utricularia* grew in the sphagnum just at the edge of the water, which I took to be *U. gibba*, L., but did not have opportunity to examine it carefully. Others could doubtless be found by a more thorough search. *Drosera longifolia*, L., here replaces *D. rotundifolia*, L. in all the bogs. It was rather late to detect many orchids, although *Habenaria tridentata*, Hooker, and *H. blephariglottis*, Hook., were still in blossom around the borders of one the ponds. The rarest of the order gathered was *H. obtusata*, Richardson, and it was still in fair condition. It grew in a dark piece of woods bordering on a beaver meadow, where there was very little underbrush and where the ground was moist but not swampy. The keen eyes of Mrs. Barnes first detected this plant when a small party of us were out on a botanical tramp, and we soon found that it was scattered freely through the wood. Most of the Carices were past finding out, but I managed to catch *C. pauciflora*, Lightfoot, and *C. exilis*, Dewey, while *C. folliculata*, L., and *C. oligosperma*, Michx., were still in full force.

I had anticipated a rich treat in looking up the ferns of the region thinking that they would be numerous and that I should perhaps obtain some rarities. But I was disappointed. About four miles down the river there is on the north side a wall of granite rock 125 feet high. Another ledge about 30 feet high stands away from this at an oblique angle and over this the water leaps, making a highly picturesque fall. One would have thought that here there might be ferns, but long search failed to discover anything more than *Polypodium vulgare*. On the borders of a pond, named after the fern, grew plenty of *Woodwardia Virginica*, Smith, but aside from this the only desirable species lay among the genera *Botrychium* and *Aspidium*. Of these forms, *B. simplex*, Hitchcock, was past, *B. matricariæfolium*, A. Br., which is in its prime near Utica in June, and for which I have hunted in vain during the fore part of July, was gathered Aug. 25, in Watson No. 4, a little *passè*, but good enough to make very respectable herbarium specimens. This shows the difference in climate between the open country and the North Woods. However, *B. ternatum*, Sw, in several varieties was in splendid condition. The smallest specimen found was 1½ inches high, with three tiny divisions of the sterile segment, each about the size of two pin-heads, the fertile segment bearing one sporangium. From this, they range up through the varieties *dissectum*, *obliquum*, and *intermedium*, to *australe*, which in my largest forms measures seven inches across the sterile segment, and ten to the summit of the fertile. These ferns grow in the open land, in old deserted pastures, particularly among loose stones and low bushes, and sometimes in beds of *Lycopodium complanatum* and *Polytrichum* moss.

Of the rarer species of *Aspidium* which flourish there, *A. Boottii*, Tuckerman, is frequently found in the woods, although not in any large quantity. It seems strange that the specific character of this fern has only recently been generally acknowledged. Want of familiarity with it has probably had much to do with its non-acceptance as a species. It closely resembles a specimen of *Lastræa odontoloma*, Moore, which I have from India. The lobes of the pinnules of the latter are a little more toothed at the extremity—that seems to be the main difference. BENJ. D. GILBERT.

§ 363. **Thirty-first Annual Report of the Botanist, C. H. Peck, to the Regents of the University of the State of New York.** Albany, 1879.—In the present, and recently distributed report, which embraces an account of the work performed during the year 1877, Mr. Peck states that during that period specimens of 189 species of plants were mounted and placed in the State Herbarium, and that of these 162 were not previously represented therein. The number of plants collected and contributed during the year, and which were new to the Herbarium, was 147; of these, 58 species—all fungi—are described by Mr. Peck as new to science. Two very interesting observations, bearing on one of the methods taken by Nature to present an over-production of insects injurious to vegetation, are recorded in the introductory portion to the report: One of these is in regard to the destruction, by a fungus, of the "Seventeen-year Locust," which, it will be rembered, made one of its septem-decennial visitations in 1877. This fungus, which Mr. Peck describes as belonging to a genus and species new to science, and which he names *Massospora Cycadina*, develops in the abdomen of the insect, and consists almost wholly of a mass of pale yellowish or clay-colored spores having the appearance to the naked eye of a lump of whitish clay. Though the insect is not killed at once by the parasite, it is manifestly incapacitated for propagation, and thence the fungus may be said to prevent, to some extent, the injury that would otherwise be inflicted upon trees by the deposition of the Cicada'a eggs. While in the Adirondack region, Mr. Peck noticed the fact that the larvæ of some unknown insect, existing in countless numbers, and feeding upon the leaves of the Alder, were fast threatening the destruction of this plant. Looking beneath the bushes for the pupæ of the insect in order to obtain a clue to the latter's identity, he was surprised to find that the larvæ, in every instance, had been killed by a parasitic fungus before they had had time to undergo their transformation; and he believes that by this provision of Nature the Alders of the above-mentioned region have been saved from utter destruction, inasmuch as in another year they would have been completely defoliated by the larvæ had but half of those which he observed been allowed to come to maturity.

We are glad to notice the fact that the Chancellor of the University has called the attention of the Legislature to the importance of printing these Museum Reports soon after their presentation, their value being greatly diminished by delay of publication. It is to be hoped that the appeal will not have been made in vain.

§ 364. **Florida Plants.**—Mr. A. H. Curtiss, of Jacksonville, Florida, writes that he has returned in safety from the eastern coast of the peninsula, where he has been collecting since the 20th of May, along the Indian and Halifax Rivers. He has brought home a large and valuable collection from a region, we believe, hitherto unexplored by botanists. This will supply the most of the material for his third Fascicle of Southern Plants, which will be ready some time in the coming winter. He collected most largely of Ferns, of which he will have extra sets ready in December. These will contain 12 Floridian species, nearly all with roots, including complete specimens of *Ceratopteris thalictroides*, Brongniart, the Floating Fern, which was found by Dr. Garber in South Florida, and recorded by Prof Eaton in BULLETIN, Oct., 1878, VI. 263. At that time Dr. Garber had as yet found only sterile plants. The very moderate price for these sets will be $1.50 post-paid, and $1.20 for duplicate sets in the same package. Mr. Curtiss is prepared to send lists of the Southern, Northern, and Western plants he has for distribution, and to prepare herbaria of any size.

Terms—*One Dollar per annum beginning with the January number. For the Botanical Directory* 40 *cents; three copies for one dollar, or twelve for three dollars. Vols. I.-V., with index, and photograph of Dr. Torrey*, $3.75. *Copies of Constitution and By-Laws of the Club*, 25 *cents. Address*, WM. H. LEGGETT, 54, *East* 81*st Street, New York. Money Orders on* Station K. *N. Y. All subscriptions or orders filled only on receipt of the money*
The Club meets regularly the second Tuesday of the month in the Herbarium, Columbia College at 7:30 *P. M. Botanists are invited to attend.* DR. THURBER *the President of the Club* ***may be found at* 245 *Broadway.***

§ 365. **North-Eastern Notes.** 1879.—As the result of another season's careful herborizing in this well-worked field, I am able to report a few finds that may be of some interest.

Arenaria verna, L., *var.* hirta, Watson, still lingers in Smuggler's Notch, Vt.: as only a few specimens scattered over a small area were found, its hold on the soil of this region, like that of Gentiana Amarella, L., *var.* acuta, Hook. f., Carex atrata, L., Luzula spicata, Desv., Woodsia hyperborea, R. Br., and some other denizens of this boreal garden, must be feeble, and its existence in the flora of Vermont, like theirs, precarious.

Pyrola secunda, L., *var.*, pumila, Paine. This distinct form of P. secunda, L., is very abundant in the cold cedar swamps and sphagnous bogs of Western Vermont. It is associated with P. rotundifolia, L., var. uliginosa, Gray, Cypripedium arietinum, R. Br., and Orchis rotundifolia, Pursh.

Nuphar luteum, Smith, is a common plant in the sluggish streams which flow into Lake Champlain on the Vermont side. In size the species is hardly less than N. advena, Ait., hence I have in previous years passed it by, mistaking it for that species. Mr. Jesup first detected it in these waters in 1873, and sent to Mr. Watson specimens which he collected near the mouth of the Missisquoi River.

It is really very distinct from N. advena, in the rhizome, smaller, white, and velvety; in the number of the sepals, which, however, is not always constant, since my friend Prof. Brainerd has not very rarely counted six; and in the fewer-rayed stigma, crimson like that of N. pumilum, Smith. With respect to its relation to the last-named species, the impression which I have derived from a study of the two species and a comparison of living plants of both with the characters given in Hooker's British Flora, is that the difference between the two is mainly one of size. With regard to the plants of the two species growing intermixed in the waters of Lake Champlain, this difference in size is so great, as far as I have observed, that there is no trouble in separating the two; but in lakes of Lower Canada and Northern Maine I have seen N. pumilum varying much in size, and growing so large as to lead me to examine it closely, to see if it might not be N. luteum.

Littorella lacustris, L., wet sandy shore of Lake Champlain, Alburgh, Vt., in flower, Sept. 2. Here is a new genus of the Order Plantagineae for the manuals of the United States. It is not in Gray's Flora of North America; but since the publication of that, Prof. Macoun has credited it to America in his catalogue of the Dominion of Canada.

Eleocharis olivacea, Torr., Bristol Pond, Vt., growing on the surface of the black mire about the edge of the pond.

On the extensive bog bordering this same pond Mr. Brainerd and I, last June, came upon a patch of Carex livida, Willd.

Rhododendron maximum, L., borders of Long Pond among the Green Mts., some twenty-five miles east of Montpelier, attaining in this, which must be one of its extreme stations westward, a height of only two or three feet.

Equisetum palustre, L., enters New England from the north through another thoroughfare than that of Lake Champlain, namely by the St. Francis River of N. Maine.

Juncus Vaseyi, Engelm., and Nabalus racemosus, Hook., extend as far east as the shores of the St. John's of N. Maine; and there, also, were found Primula Mistassinica, Michx., Anemone multifida, DC., Vaccinium caespitosum, Michx., and Allium Schoenoprasum, L.

As Erigeron acre, L., was seen not many miles north of Maine, it is very probable that it grows within its borders.

On the south shore of the St. Lawrence, about one hundred miles below Quebec, I found myself last August surrounded by a flora almost subarctic in character. Stunted growths of Abies alba, Michx., A. nigra, Poir, and A. balsamea, Marsh., constituted almost the entire arboreal vegetation seen along the shore. Growing from the crevices of rocks, usually within reach of the salt waves, Plantago maritima, L., a plant which Gray's Flora locates north of the Gulf of St. Lawrence, was abundant. Higher up, Empetrum nigrum, L., and Vaccinium Vitis-Idaea, L., carpeted the scanty soil, and with these mingled Draba incana, L., D. arabisans, Michx., Zygadenus glaucus, Nutt., Potentilla Pennsylvanica L., Cerastium arvense, L., Archangelica Gmelini, DC., Conioselinum Canadense, T. & G., Gentiana Amarella, L., *var.* acuta, Hook. f., Halenia deflexa, Griseb., etc.

On the beaches, among the more common plants of the seaside, Mertensia maritima, Don, trailed profusely its glaucous fillets spangled with blue flowers, and Poa glumaris, Trin., a species of Siberia and Alaska, had spread abundantly by means of its thick subterranean stems. Elymus mollis was common with the latter. In the marshes Nabalus racemosus, Hook., was common, (as, also, in higher situations,) Aster angustus, T. & G., was seen; Catabrosa aquatica, Beauv., was not rare; and common with Carex maritima, Vahl., and C. salina, Wahl., were C. Norvegica, Schk., C. limula, Fries, and C. helvola, Blytt? The purple plumes of Hordeum jubatum, L., were waving everywhere. In places where the grasses and sedges were sparse, the slimy surface of the marsh was covered with Stellaria humifusa, Rottball.; and, where a rill spread over the border of a marsh, I came upon a large patch of Pedicularis palustris. L., var. Wlassoviana, Bunge, a plant hitherto supposed to grow no nearer than Hudson's Bay. In low wet places among the rocks with Juncus Balticus, Dethard, Glaux maritima, L., etc., Pleurogyne rotata, Griseb., and Blysmus rufus, Link., were detected. In the fields near the shore, the herbage upon which the cows were feeding was chiefly composed of Poa pratensis, L., indigenous form, Festuca ovina, L., supposed also to be native, Vicia cracca, L., Carex atrata, L., Poa caesia, Smith, Euphrasia officinalis, L., a form four to six inches high and much branched, doubtless introduced from Europe like the two following, Rhinanthus Crista-galli, L., Silene inflata, Smith, Primula farinosa, L., Potentilla Pennsylvanica, L., P. tridentata, Ait., and Gentiana Amarella, L., *var.* acuta, Hook, f.

C. G. PRINGLE.

EAST CHARLOTTE, VT.

Aspidium spinulosum.—In the North Woods I found an Aspidium in regard to which, after considerable study, I am not able to satisfy myself. The fern of which I speak was found at the foot of a declivity in damp woods, in a rich bottom through which runs a brook. It is of medium size, from 1 1-2 to 2 feet high, the stipe and rachis slender, fronds bipinnate, pinnae and pinnules not closely set but rather distant from each other, pinnules of the lower pinnae lobed or somewhat pinnatifid, but all having distinct spaces between them, and not touching or overlapping as do the pinnules of *A. intermedium.* Another peculiarity is, that pinnae of the same pair often differ from ½ to 1 inch in length, so the fronds are frequently unsymmetrical. After reviewing all the descriptions of species and varieties in this section which I can find, Newman's *Lastræa spinosa* seems to come nearest to it. Let me quote from his delightful "History of British Ferns," 2nd edition,. "The pinnae are are pinnate, and the pinnules detached and often distant. On the first pair of pinnae the first and second inferior pinnules are of nearly equal length, and are nearly twice as long as the corresponding superior ones; a somewhat similar discrepancy is observable in the pinnules of the second pair of pinnae, but beyond these it becomes scarcely observable; some of the lower pinnules are deeply pinnatifid, almost pinnate. The veins in the pinnules are alternately branched, each system of branches entering a division of the pinnule, and the *anterior* branch bearing a circular cluster of capsules; this cluster is covered by a flat reniform involucre, the margins of which are sinuate, generally entire, and always *without* stalked glands, a character which, as far as my observation has extended, is constant, and is of great importance in distinguishing this species from those which follow. (viz: *Lastræa dilatata*, and *recurva.*) This character sufficiently distinguishes the present plant from the *spinulosa* of Swartz, Willdenow, Schkuhr and Francis. Owing to the constant position of these clusters on each pinnule, they form a regular double line, the midvein of the pinnule passing up the centre; but when the pinnule is completely divided into lobes, each branch of the vein usually bears a cluster of capsules; this is more frequently the case in those pinnules which are nearest the main stem of the frond; and it may be observed that the clusters on all, except the usual capsule-bearing branch, are of smaller size. The seed is confined to the upper portion of the frond; exceptions to this are of rare occurrence. Each branch of the vein enters one of the serratures of the pinnule, but terminates before reaching the spine, with which it is quite unconnected."

I have condensed the above by leaving out sentences or parts of sentences, retaining only the pith of the description. It gives a very correct idea of the fern which I have found. I would add that the anterior vein upon which the sori are situated sometimes terminates "within the radius of the fruit-dot," as Mr. Davenport phrases it, but almost as often goes beyond it. It will be noticed that Newman classes Swartz with Willdenow and others as giving *stalked glands* to the involucre of *spinulosum*, and in his description of *dilatatum*, or *L. multiflora*, as he calls it, he repeats the assertion, and for *that* reason he identifies *spinulosum* with *dilatatum*—a reason exactly the opposite of Mr. Davenport's for doing the same thing. My own edition of Swartz is that of 1806, and in that he says nothing about the indusium. May there not be a later edition in which the indusium is mentioned? At all events Newman identifies his species with *Polystichum spinosum*, Roth; and Swartz in his addenda while giving *P. spinosum*, Roth, as one of the synonyms of *A. spinulosum*, raises the question "an vere hujus?" whether it truly belongs to this? Desvaux is the author whose description of *Nephrodium, spinulosum* Hooker has chosen to follow in his *Syn. Fil.*, although Desvaux is a later writer than Swartz; and Hooker says of it that the involucre is *not* gland-ciliated. But *N. dilatatum*, which is taken from the same author, and is classed as a variety of *spinulosum*, is said to have the "involucre gland-ciliated." And yet our American writers claim that neither of the native representatives of these ferns possess gland-ciliated involucres. It would seem as if a character which is so undecided, and which varies so much in different countries, were better dropped altogether as a distinguishing feature of the species.

Inasmuch as I am one of those who regard the different forms of *A. spinulosum* as variations rather than varieties, my attempt to find a description which would fit the Watson form has been made merely out of curiosity, and not with a desire to introduce any further confusion into the nomenclature. BENJ. D. GILBERT.

§ 366. **Freeman J. Bumstead, M. D., LL.D.**—Dr. Bumstead, one of the earliest members of the Torrey Botanical Club, died Nov. 28, at the too early age of 53. He was thrown from a carriage in Central Park, last spring; the driver was killed, and the Doctor had his left arm broken and was besides severely bruised. A friend, calling on him shortly after, found him confined to his bed, but hard at work on a new edition of his medical treatise. But he overtasked himself and never regained his health.

Dr. Bumstead was a native of Boston, was trained at the Boston Latin School, and graduated with Whitney, the Sanscrit scholar, at Williams College. We have heard him tell that Whitney taught him how to prepare ornithological specimens. Like many other graduates of Williams, he cherished a warm attachment to his alma mater. and was highly gratified when, last summer, she conferred on him the degree of Doctor of Laws. In his profession in this city Dr. Bumstead filled various positions of honor and influence.

About the year 1871 he went to Europe with his family, and was absent two or three years. He occupied a good portion of his time there in studying under Pfitzer at Heidelberg, Boehm at Vienna and others, their methods of investigating the anatomy and physiology of vegetable life, and returned home with the hope and intention of doing some good work in this direction. But the demands of his profession and of a growing family deferred the day till he was surprised by death.

Dr. Bumstead was at once an energetic and wise man, and a warm-hearted friend. He had not of late years frequented the Club meetings, but those of us who were wont to gather around his beloved Dr. Torrey will keenly feel that a link is missing.

Catalogue of the Phæogamous and Acrogenous Plants growing without cultivation within five miles of Pine Plains, Duchess Co., N. Y.

BY LYMAN H. HOYSRADT.

October 19*th*, 1875.

RANUNCULACEÆ.

Clematis verticillaris, DC. ; vid. § 127, Vol. V. ; abundant on Risedorf Hill.—C. Virginiana, L. ; common.

Anemone cylindrica, Gray ; vid. § 127, Vol. V.—A. Virginiana, L. ; common.—A Pennsylvanica, L. ; frequent.—A nemorosa, L. ; quite common.

Hepatica triloba, Chaix. ; common.—H. acutiloba, DC. ; rare, vid. § 127, Vol. V.

Thalictrum anemonoides, Michx. ; very common.—T. dioicum, L. ; common.—T. purpurascens, L. ; common on Stissing Mt.—T. Cornuti, L. ; common.

Ranunculus multifidus, Pursh ; vid. § 127, Vol. V. ; but frequent elsewhere, Ten Eyck's and L. Smith's swamps, etc.—R. abortivus, L. ; common.—R. sceleratus, L. ; not frequent.—R. recurvatus, Poir. ; common.—R. Pennsylvanicus, L.; common.—R. fascicularis, Muhl. ; common in our hilly woods and on the Mountain.—R. repens, L. ; common.—R. bulbosus, L. ; rare, in fields east of Trout Brook.—R. acris, L. ; very common.

Caltha palustris, L. ; common.

Coptis trifolia, Salisb. ; common.

Aquilegia Canadensis, L. ; common.

Nigella Damascena, L. ; along fences of yards.

Actæa spicata, L. *var.* rubra, Michx. ; rather common, in our rich ravines.—A. alba. Bigel. ; common, more so than preceding.

Cimicifuga racemosa, Ell. ; rare near the village, very abundant on Winchell Hill.

MAGNOLIACEÆ.

Liviodendron tulipifera, L. ; frequent, especially along streams on southwest part of Mountain.

MENISPERMACEÆ.

Menispermum Canadense, L. ; common.

BERBERIDACEÆ.

Berberis vulgaris, L. ; naturalized along banks of Mud Pond.

Caulophyllum thalictroides, Michx. ; vid. § 127, Vol. V.

Podophyllum peltatum, L. ; vid. § 127, Vol. V. ; R. Ham's swamp meadow.

NYMPHÆACEÆ.

Brasenia peltata, Pursh ; frequent, very abundant in Mud Pond, (*G. M. Wilber*) and in most of the others.

Nymphæa odorata, Ait. ; common.

Nuphar advena, Ait. ; very common.

SARRACENIACEÆ.

Sarracenia purpurea, L.; quite common ; in Spruce Hole, &c.

PAPAVERACEÆ.

Papaver somniferum, L. ; about garden fences.

Chelidonium majus, L., common ; thoroughly naturalized in this section ; abundant along roadsides and even in several ravines of Little Stissing Mt.

Sanguinaria Canadensis, L. ; common.

FUMARIACEÆ.

Dicentra cucullaria, DC. ; common in all our rich woods and ravines.

Corydalis glauca, Pursh ; common. (May to October)—C. aurea, Willd. ; vid. § 127, Vol. V. ; on cliffs above Muggin House Rocks.

Fumaria officinalis, L. ; vid. § 127, Vol. V.

CRUCIFERÆ.

Nasturtium officinale, R. Br. ; rather common ; apparently indigenous in the secluded mountain streams.—N. palustre, DC. ; frequent ; *Var.* hispidum, common.—N. Armoracia, Fries ; rather common.

Dentaria diphylla, L. ; common.—D. maxima, Nutt. ; vid. § 127, Vol. V. ; woods by Silvernail Falls.—D. laciniata, Muhl. ; common.

Cardamine rhomboidea, DC. ; rather common.—C. pratensis, L. ; quite rare ; in Wappinger's Marsh, L Smith's Walnut Swamp, &c.—C. hirsuta, L. ; frequent ;—*Var.* sylvatica, Gray, rather scarce on Little Stissing Mt.

Arabis lyrata, L. ; common.—A. hirsuta, Scop. ; vid. § 127, Vol. V. A. lævigata, DC. vid. § 127, Vol. V.—A. Canadensis, L. ; vid. § 127, Vol. V. ; the three foregoing are all quite common, particularly on Stissing Mt.—A perfoliata, Lam ; not common, in fields under Stissing Mt.

Barbarea vulgaris, R. Br. ; very common.

Erysimum cheiranthoides, L. ; abundant along Shekomeko Ck. at base of Brigg's Hill.

Hesperis matronalis, L. ; escaping along fence borders of fields.

Sisymbrium officinale, Scop., very common.

Brassica Sinapistrum, Bois. ; a troublesome weed in fields.—B. nigra, Bois ; common.—B. campestris, L. ; occasional.

Capsella Bursa-pastoris, Mœnch ; very common.

Lepidium Virginicum, L. ; very common.—L. campestre, L. ; rather scarce, but abundant in fields along east base of Attlebury Hill.

VIOLACEÆ.

Solea concolor, Ging. ; very abundant along east base of Risedorf Hill ; vid. § 109, Vol. V.

Viola rotundifolia, Michx. ; rare, on Mountain.—V. lanceolata, L. ; rare ; abundant around Grass Pond ; Thompson Pond.—V. blanda, Willd. ; very common.—V. Selkirkii, Goldie ; vid. § 127, Vol. V.—V. cucullata, Ait. ; very common ; *Var.* palmata, Gray. frequent.—V. sagittata, Ait. ; common.—V. pedata, L. ; rather scarce.—V. canina, L. *Var.* sylvestris, Rigel ; very common.—V. pubescens, Ait. ; common ; *Var.* scabriuscula, Torr and Gr. ; not rare.

CISTACEÆ.

Helianthemum Canadense, Michx.; rather common; abundant about summits of Stissing and Little Stissing.

Lechea major, Michx.; rather scarce; Stissing Mt.—L. minor, Lam.; common.

DROSERACEÆ.

Drosera rotundifolia L. quite common, back of Stissing Point, and elsewhere. D. longifolia, L.; rare; about Bingham Pond on Mountain.

HYPERICACEÆ.

Hypericum pyramidatum, Ait.; abundant in a dryish swamp along Roelif Jansen's Kill, above Silvernail Bridge, with *Blephilia hirsuta.*—H. ellipticum, Hook., in Wappingers Ck. Marsh (*G. M. W.* and *L. H. H.*)—H. perforatum, L.; very common.—H. corymbosum, Muhl.; common.—H. mutilum, L. very common.—H. Canadense, L., scarce about Pine Plains, but common a few miles away. *Var.* major, Gray is the common form; this is abundant in our peat-bogs, marshes, and on muddy shores of the ponds.—H. Sarothra, Michx. common.

Elodes Virginica, Nutt.; common.

CARYOPHYLLACEÆ.

Dianthus Armeria. L.; not yet common.

Saponaria officinalis, L.; common.

Silene inflata, Smith; vid § 127, Vol V; becoming common.—S. Pennsylvanica, Michx.; common on slate hills north of Pine Plains.—S. antirrhina, L.; quite common.—S. noctiflora, L.; vid. §127, Vol., V., abundant in fields on Carpenter Hill.

Lychnis Githago, Lam.; now only seen in wheat fields.

Arenaria serpyllifolia, L.; common.—A. lateriflora, L. very common in many of the marshes.

Stellaria media, Smith; common.—S. longifolia, Muhl, and S. borealis, Bigel.; vid. §127, Vol. V; both rather rare.

Cerastium viscosum, L.; very common.—C. nutans, Raf.; scarce along some of the mountain marsh streams.—C. arvense, L.; common on Stissing Mts.

Sagina procumbens, L.; along mountain stream.

Anychia dichotoma, Michx.; common.

Scleranthus annuus, L.; common.

Mollugo verticillata, L.; rather common.

PORTULACACEÆ.

Portulaca oleracea, L.; common.

Claytonia Virginica, L.; quite rare; vid. § 127, Vol. V.

MALVACEÆ.

Malva rotundifolia, L.; common.—M. moschata, L.; vid. § 127, Vol. V.

Abutilon Avicennæ, Gærtn.; common along roadsides.

TILIACEÆ.

Tilia Americana, L.; common.

LINACEÆ.

Linum Virginianum, L.; not very common.—L. usitatissimum, L.; an escape; until about 25 years ago, this plant was grown largely in this section, for the manufacture of home-made linen.

GERANIACEÆ.

Geranium maculatum, L.; common.—G. Carolinianum, L.; scarce, only found on Stissing Mt.—G. Robertianum, L.; common.

Impatiens pallida, Nutt.; common in ravines, etc.; vid. § 127, Vol. V.—I. fulva, Nutt.; very common.

Oxalis violacea, L.; not common, but abundant in the few stations discovered.—O. stricta, L.; very common.

RUTACEÆ.

Xanthoxylum Americanum, Mill.; common.

SIMARUBACEÆ.

Ailanthus glandulosus, Desf.; running wild.

ANACARDIACEÆ.

Rhus typhina, L.; common.—R. glabra, L.; very common.—R. copallina, L.; common on Stissing Mt., particularly on the south end.—R. venenata, D. C.; common.—R. Toxicodendron L.; common..

VITACEÆ.

Vitis Labrusca, L.; common.—V. astivalis, Michx.; not common. V. cordifolia, Michx.; common.

Ampelopsis quinquefolia, Michx.; very common.

RHAMNACEÆ.

Rhamnus catharticus, L. rare; vid. § 127. Vol. V.—R. alnifolius, L' Her.; abundant in our *Valerian* marshes and swamps.

Ceanothus Americana, L.; common.

CELASTRACEÆ.

Celastrus scandens, L.; common.

SAPINDACEÆ.

Staphylea trifolia, L.; common.

Æsculus Hippocastanum, L.; running wild.

Acer Pennsylvanicum, L.; common on Stissing Mt.—A. spicatum, Lam.; abundant in ravines of Stissing Mt. and Mount Ararat. A. saccharinum, Wang.; very common.—A. dasycarpum, Ehrh.; said to have been seen growing in some of our swamps and along our large streams, if so it must be rare, for I have never seen it growing wild anywhere in this region.—A. rubrum L.; very common.

POLYGALACEÆ.

Polygala sanguinea, L.; common.—P. verticillata, L.; common.—P. ambigua, Nutt.; scarce.—P. Senega, L.; common; abundant on the mountain, and in limestone fields and woods.—P. paucifolia, Willd.; common everywhere.

LEGUMINOSÆ.

Trifolium arvense, L.; common.—T. pratense, L.; common.—T. repens, L.; very common.—T. agrarium, L.; not very common.—T. procumbens, L.; common.

Melilotus officinalis, Willd.; quite common along roadsides.—M. alba, Lam.; more common than preceding species.

Medicago lupulina, L.; very common in our fields and waste places.

Coronilla varia, DC.; well naturalized in two or three stations; Eno lot; vid. § 127, Vol. V.

Robinia Pseudacacia, L.; common; thoroughly naturalized.—R. viscosa, Vent.; running wild.

Tephrosia Virginiana, Pers.; vid. § 127, Vol. V.

Desmodium nudiforum, DC.; very common.—D. acuminatum, DC.; common.—D. rotundifolium, DC.; common in our rocky woods. — D. cuspidatum, Torr. & Gray.; rather common; Snake Hill, Stissing Mt., etc.—D. Dillenii, Darl.; not common. —D. paniculatum, DC., quite common in our woods.—D. Canadense, DC.; very common.—D. ciliare, DC.; scarce; on Little Stissing.—D. Marilandicum, Boott.; not common; near McIntosh Place, on Little Stissing.

Lespedeza procumbens, Michx,; quite common; Stissing Mt., Mill Hill, etc., vid. § 127, Vol. V.—L. violacea, Pers, and *varieties;* common.—L. hirta, Ell.; quite common.—L. capitata, Mchx; common.

Vicia sativa, L; rather scarce; in fields and along roadsides.

Lathyrus palustris, L.; rare; in swamps near Hot Ground, (*G. M. Wilber and L. H. H.*)

Apios tuberosa, Mœnch.; common; Thomas Meadow.

Amphicarpæa monoica, Nutt.; common.

Baptisia tinctoria, R. Br.; common.

Cassia Marilandica, L.; not uncommon; along Wappingers and Roelif Jansen's Creeks.

Gleditschia triacanthos, L.; sparingly running wild.

ROSACEÆ.

Prunus Americana, Marshall; common.—P. pumila, L.; not scarce; vid. § 127, Vol. V.—P. Pennsylvanica, L.; decidedly common.—P. Cerasus, L.; fully naturalized in the open borders of some woods and also in copses.—P. Virginiana, L.; very common.—P. serotina, Ehr.; common.

Spiræa salicifolia, L.; very common.—S. tomentosa, L.; very common in our bogs and marshes.

Agrimonia Eupatoria, L.; common.

Geum album, Gmelin.; common.—G. Virginianum, L.; common, but less so than preceding.—G. strictum, Ait.; very common; vid. § 127, Vol V.—G. rivale, L.; not uncommon in some of our swamps and low meadows; along Trout Brook, South Poughkeepsie R. R., etc.

Waldsteinia fragarioides, Tratt.; abundant in certain localities; Old Camp Ground back side of Little Stissing Mt., Peck Swamp, etc.; vid. § 127, Vol. V.

Potentilla Norvegica, L.; very common. P. Canadensis, L.; very common; *Var.* simplex; frequent.—P. argentea, L.; common.—P. arguta, Pursh.; common on Stissing Mt.—P. fruticosa, L.; common; vid. § 127, Vol. V.—P. tridentata, Ait.; Summit of Stissing Mt.

Fragaria Virginiana. Erh.; very common everywhere.—F. vesca, L.; common, on hills with preceding, but not so generally diffused.

Rubus odoratus, L.; common.—R. triflorus, Rich.; common in our deep, dryish swamps and marshes.—R. strigosus, Michx.; very common.—R. neglectus, Peck.; rather uncommon, growing in same locations as preceding, but seeming to be fully distinct, with never any intermediate specimens.—R. occidentalis, L.; very common.—R. villosus, Ait.; common; *Var.* frondosus, in L. Smith's swamp; *Var.* humifusus, frequent.—R. Canadensis, L.; very common.—R. hispidus, L.; common.

Rosa Caroliniana, L.; common.—R. lucida, Ehr.; common.—R. blanda, Ait.; rare, on Stissing Mt.—R. rubiginosa, L.; rather common.—R. micrantha, Smith.; scarce.—R. cinnamomea, L.; growing spontaneously in several localities.

Cratægus coccinea, L.; common.—C. tomentosa, L.; not uncommon; *Var.* punctata, quite frequent.—C. Crus-galli, L.; quite common.

Pyrus arbutifolia, L.; *Var.* erythrocarpa; *Var.* melanocarpa; both common, particularly the latter.—P. Americana, DC.; frequent on some of our mountains; in swamp near summit of Stissing Mt. (*G. M. Wilber.*)

Amelanchier Canadensis, Torr. & Gr.; common; *Varr.* Botryapium and oblongifolia; quite frequent.

SAXIFRAGACEÆ.

Ribes Cynosbati, L.; quite common.—R. hirtellum, Michx.; common.—R. rotundifolium, Michx.; Stissing Mt. and adjoining rocky hills.—R. floridum, L.; common.—R. rubrum, L.; not rare; further, for this and preceding, vid. § 127, Vol. V.

Parnassia Caroliniana, Michx.; very common in all our marshes and low meadows.

Saxifraga Virginiensis, Michx.; very common.—S. Pennsylvanica, L.; common; Valerian marsh W. of Attlebury Station.

Mitella diphylla, L.; very common in all our moist woods, etc.

Tiarella cordifolia, L.; not common; along Roelif Jansen's Kill, and its small tributary, Furnace Brook.

Chrysoplenium Americanum, Schwein.; common.

CRASSULACEÆ.

Penthorum sedoides, L.; common.

Sedum Telephium, L.; common; along roadsides and in fields.

HAMAMELACEÆ.

Hamamelis Virginica, L.; very common.

HALORAGEÆ.

Myriophyllum spicatum, L.; quite common in Stissing and Mud Ponds.—M. verticillatum, L.; also frequent in our ponds.

Proserpinaca palustris, L.; quite common; swamp on Stissing Point, etc.

ONAGRACEÆ.

Circæa Lutetiana, L.; common.—C. alpina, L.; abundant in most of the deep woods; Strever's Grove.

Epilobium angustifolium, L.; common.—E. palustre, L., *Var.* lineare, Gray; common in all our bogs and marshes; abundant in *Valeriana sylvatica* habitats.—E. molle, Torr.; rare; in swamp east of Jno. Titus' place.—E. coloratum, Muhl.; very common.

Œnothera biennis, L.; very common; *Var.* grandiflora, along Poughkeepsie R. R., near Station.—Œ. fruticosa, L.; southwest of Stissing Station. [*Extra-limital*]—Œ. pumila, L.; common everywhere.

Ludwigia alternifolia, L.; rather rare; along Wappingers Creek, (*G. M. Wilber*), and in Wappingers Marsh.—L. palustris, Ell.; common.

LYTHRACEÆ.

Ammania humilis, Michx; (?); in old pools, west of Attlebury Hill, (1873)—station now destroyed.

Nesæa verticillata, H.B.K.; rather common; in old ditches, Wappingers Marsh, opp. Eb. Husted's; Jno. Fingar's Cranberry Marsh.

Cuphea viscosissima, Jacq.; rare; D. Bush's meadow.

CACTACEÆ.

Opuntia vulgaris, Mill.; on rocky hills, towards Hudson River, *R. Peck.* [*Extra-limital.*]

CUCURBITACEÆ.

Sicyos angulatus, L.; common along our large creeks, and about yards.

Echinocystis lobata, Torr. & Gr.; abundant along Rœlif Jansen's Kill, where it is indigenous.

UMBELLIFERÆ.

Hydrocotyle Americana, L.; common.

Sanicula Canadensis, L.; not common; south part of Stissing Mt., etc.—S. Marilandica, L.; very common.

Daucus Carota, L.; very common everywhere, fields and roadsides.

Heracleum lanatum, Michx.; rather rare; in meadows, back of Notch of Stissing Mt.

Pastinaca sativa, L.; very common.

Archangelica hirsuta, Torr. & Gr.; common in our dry woods and on Mountain.—A. atropurpurea, Hoffm.; common.

Conioselinum Canadense, Torr. & Gr.; decidedly common in all our cold swamps; Pulver's Corner marshes.

Æthusa Cynapium, L.; rare, about a few yards.

Thaspium aureum, Nutt.; very common; a pernicious weed in many moist meadows.—T. trifoliatum, Gray; rather common in all our open woods; Mill Hill, etc.

Zizia integerrima, DC.; quite common; Risedorf Hill, Snake Hill, etc.

Cicuta maculata, L.; common.—C. bulbifera, L.; common, in wet places and along overflowing streams.

Sium lineare, Michx.; common.—S. angustifolium, L.; in Muddy Brook, running through Mulberry Meadow Swamp, on Stissing Mt. (I am in some doubt concerning this plant, not having submitted it to competent authority. *Aspidium cristatum, Var. Claytonianum*, Eaton, grows very abundantly along the stream, in the same swamp.)

Cryptotænia Canadensis, DC.; common.

Osmorrhiza longistylis, DC.; common.—O. brevistylis, DC.; common.

Conium maculatum, L.; not very common; Mont Ross road; Hot Ground, etc.

ARALIACEÆ.

Aralia racemosa, L.; common in our rich woods and ravines.—A. hispida, Michx.; rare; in Stanford. [*Rather extra-limital*].—A. nudicaulis, L.; very common, in all our woods and on Mountain. A. quinquefolia, Gray; I have it from trustworthy authority that this plant used to be frequent on southern part of Stissing Mountain, being much sought after by the botanic physicians and simplers of those days, but I have never been able to find it, although I have hunted for it repeatedly. It has probably been exterminated, though it may yet be found in some of the secluded ravines of the Mountain.—A. trifolia, Gray; rather common; Peck's Swamp; Silvermail Falls Flat.

CORNACEÆ.

Cornus Canadensis, L.; not common; abundant about swamps in southern part of Stissing Mt.; Tamarack Swamp at Hot Ground.—C. florida, L.; common.—C. circinata, L'Her.; common.—C. sericea, L.; common.—C. stolonifera, Michx.; very common.—C. paniculata, L'Her.; very common.—C. alternifolia, L.; rather common.

Nyssa multiflora, Wang.; rather common in our mountain swamps, and elsewhere.

CAPRIFOLIACEÆ.

Lonicera parviflora, Lam.; rather common on Mountain and in hilly woods; also grows in many of our deep peaty swamps.

Diervilla trifida, Mœnch; very common.

Triosteum perfoliatum. L.; common on the Mountain; Mt. Ararat, and other rocky woods.

Sambucus Canadensis, L.; very common.—S. pubens, Michx.; quite common; Muggin House Rocks; Stissing Mountain and Mt. Arrarat, etc.

Viburnum Lentago, L.; common.—V. nudum, L.; abundant in swamps southern part of Stissing Mt.—V. dentatum, L.; common.—V. pubescens Pursh; common on Stissing Mountain, Mt. Ararat and other rocky woods.—V. acerifolium, L.; common.—V. Opulus, L.; rather common; Mt. Ararat; abundant in swamps near Pulver's Corner with *Valeriana sylvatica*, etc.—V. lantanoides, Michx.; quite rare, on mountains and in a few deep ravines.

RUBIACEÆ.

Galium Aparine, L.; common.—G. asprellum, Michx.; common.—G. trifidum, L.; common; *Var.* pusillum, with *Valeriana sylvatica* at Pulver's Corner.—G. triflorum, Michx. common.—G. pilosum, Ait.; common on Stissing Mt.—G. circæzans, Michx.; common.—G. lanceolatum, Torr., nearly as common as preceding.—G. boreale, L.; ravines eastward, but extra-limital; it undoubtedly grows on the Mountain.

Cephalanthus occidentalis, L.; common.

Mitchella repens, L.; common.

Houstonia cærulea, L.; not common; but abundant in R. Ham's meadows, (*Miss Hattie D. Bostwick*); also near Shekomeko.

VALERIANACEÆ.

Valeriana sylvatica, Richards, vid. § 48 and § 56, Vol. VI.; this rare plant is certainly not scarce about Pine Plains. It is abundant in the following localities: in Mulford Wheeler's peat bog or marsh near Pulver's Corner; Pogonia swamps, near Attlebury; Wappingers Marsh, near base of Stissing Mt.; Marsh west of Croghan Hill, etc. It embraces a circuit of about twelve miles in diameter, this being the extent thus far of my botanical explorations; hence the plant undoubtedly extends much farther, and very probably will be found in Massachusetts and Connecticut, one of my stations being within *three* miles of the line of the latter State.

COMPOSITÆ.

Vernonia Noveboracensis, Willd.; westward towards Hudson River, but *extra-limital.*

Eupatorium purpureum, L.; very common.—E. sessilifolium, L.; not common, but abundant on south end of Risedorf Hill, and elsewhere. E. perfoliatum, L.; common.—E. ageratoides, L.; common.

Mikania scandens, L.; very rare; abundant in marsh east of Croghan Hill.

Tussilago Farfara, L.; exceedingly common along most of our streams and elsewhere.

Sericocarpus conyzoides, Nees.; common.

Aster corymbosus.; Ait.; common.—A. macrophyllus, L. common on Mountain and in open woods.—A. patens, Ait.; common.—A. lævis, L.; common; *Var.* lævigatus, and *Var.* cyaneus; rather common.—A. undulatus, L.; very common,—perhaps, our most common Aster.—A. sagittifolius, Willd.; rare, ravines, on Hunting Hill.—A. cordifolius, L.; common.—A. ericoides, L.; rather common.—A. multiflorus, Ait.; common.—A. dumosus, L.; rather rare.—A. Tradescantia, L.; very common.—A. miser, L., Ait.; common.—A. simplex, Willd; not common.—A. Novi-Belgii, L.; rare, sparingly along Wappingers Creek, below Attlebury.—A. longifolius, Lam.; rather uncommon.—A. puniceus, L.; very common.—A. Novæ-Angliæ, L.; very common.—A. acuminatus, Michx.; abundant about the swamps, on southern part of Stissing Mt., Mulberry Meadow, etc.; Fingar cranberry marsh.

Erigeron Canadense, L.; very common.—E. bellidifolium, Muhl.; common.—E. Philadelphicum, L.; rather common; Silvernail Falls, etc.—E. annuum, Pers.; very common.—E. strigosum, Muhl.; very common.

Diplopappus umbellatus, Torr. & Gr.; rather common about most of our swamps, on mountain and plain.—D. cornifolius, Darl.; common; abundant in nearly all our woods, and on Mountain,—our most common *Diplopappus.*

Solidago squarrosa, Muhl.; common,—one of our most common *Solidagos* in our open woods.—S. bicolor, L.; very common.—S. latifolia, L.; common, along the streams and in our cold woods.—S. cæsia, L.; very common.—S. puberula, Nutt.; very common on southern and, also, the higher part of Stissing Mt.—S. stricta, Ait.; common, in all our marshes and peat-bogs.—S. speciosa, Nutt.; very abundant on north side of Mill Hill; N. E. end of Risedorf Hill, with *S. rigida*, and elsewhere.—S. thyrsoidea, E. Meyer; on the bluffs above Gypsy's Glen, south-west of summit of Stissing Mt.—S. rigida, L.; quite rare, but grows plentiful on and at base of Risedorf Hill.—S. neglecta, Torr. and Gray.; rare in some of our large swamps.—S. patula, Muhl.; very common in our swamps and low grounds.—S. arguta, Ait.; common.—S. Muhlenbergii, Torr. & Gray; very common in all our woods and on Mountain.—S. altissima, L.; very common. S. ulmifolia, Muhl.; rather common in all our open, rocky limestone woods; Mill Hill.—S. odora, Ait.; not common, but frequent, with *Var.* inodora, on southern part of Stissing Mt.—S. nemoralis, Ait.; very common.—S. Canadensis, L.; very common.—S. serotina, Ait.; common.—S. gigantea, Ait.; common.—S. lanceolata, L.; very common.

I take a certain pride in the list of *Solidagos* and *Ferns* of this town,—all growing within two or three miles of the village.

Inula Helenium, L.; common along roadsides.

Ambrosia trifida, L.; rare; near mouth of Shekomeko, and along Roelif Jansen's Kill.—A. artemisiæfolia, L. very common.

Xanthium strumarium, L.; common.

Rudbeckia laciniata, L.; common.—R. triloba, L. quite common in fields and along roadsides, south end of Stissing Mt., also along some of our large streams.—R. hirta, L.; too common in our fields.

Helianthus annuus, L.; somewhat spontaneous.—H. strumosus, L.; common.—H. divaricatus, L.; common.—H. decapetalus, L.; common; along Shekomeko Ck. and other streams. I have generally found this species accompanying *Struthiopteris Germanica*, Willd.—H. tuberosus, L.; quite common; well naturalized.

Bidens frondosa, L.; very common.—B. connata, Muhl.; common. B. cernua, L.; not common; around some cold, wet swamps;

in some specimens it approximates very closely to the next.—B. chrysanthemoides, Michx.; common.

Helenium autumnale, L.; quite frequent along Shekomeko Ck. and Roelif Jansen's Kill., etc.

Maruta cotula, DC.; very common.

Achillea Millefolium, L.; very common; the pink *variety* is quite handsome.

Leucanthemum vulgare, Lam.; very common.—L. Parthenium, Godron.; well established along yard fences, and also in Sylvan Glen, Ham's Woods.

Tanacetum vulgare, L., and *Var.* crispum; both common.

Artemisia Absinthium, L.; around a few old yards.

Gnaphalium decurrens, Ives; rather common in our upper fields and woods; Snake Hill.—G. polycephalum, Michx.; common.—G. uliginosum, L.; common.

Antennaria margaritacea, R. Brown; common.—A. plantaginifolia, Hook.; common.

Erechthites hieracifolia, Raf.; common.

Senecio vulgaris, L.; very rare, in a few waste places.—S. aureus, L., and two or three of its *varieties*, common.

Centaurea Cyanus, L.; about a few old gardens.

Cirsium lanceolatum, Scop.; very common.—C. discolor, Spreng.; quite common.—C. muticum, Michx.; common in our swamps.—C. pumilum, Spreng.; common.—C. arvense, Scop.; too common; a terrible pest in many fields.

Onopordon acanthium, L.; rare; in one of H. Ham's fields.

Lappa officinalis, Alli.; common.

Krigia Virginica, Willd.; common on gravelly banks; Stissing Point and on Mountain.

Hieracium Canadense, Michx.; quite common; along N. road of Stissing Pond and so under Mountain, etc.—H. scabrum, Michx.; common.—H. Gronovii, L.; quite rare.—H. venosum, L.; common.—H. paniculatum, L.; common.

Nabalus albus, Hook.; common.—N. altissimus, Hook.; common in all our cold woods.—N. Fraseri, DC.; not common; in open lands, southern slope of Stissing Mt.

Taraxacum Dens-leonis, Desf.; very common.

Lactuca Canadensis, L.; very common; *Var. integrifolia*, Torr. & Gray; sparingly on Winchell Hill.

Mulgedium leucophæum, DC.; common.

Sonchus oleraceus, L.; in waste grounds of our village (*G. M. Wilber.*) and in some rich cultivated fields.—S. asper, Vill.; frequent, but sparing.—S. arvensis, L.; roadsides, near the Hudson River. [*extra-limital.*]

LOBELIACEÆ.

Lobelia cardinalis, L.; common along the mountain streams and in deep swamps.—L. syphilitica, L.; common in all our swamps and low grounds.—L. inflata, L.; common.—L. spicata, Lam.; common; much earlier than any of the other species, beginning to blossom early in June. L. Kalmii, L.; this is one of the prettiest as well as one of the most common Lobelias of this region. In August and September, our marshes, open swamps and wet meadows are beautifully colored with the bright blue corollas of this handsome species. I do not find it on either "wet limestone rocks or banks," as Dr. Gray says in his *Manual*, but it grows in the most profusion here in alluvial grounds, either wild or in partial cultivation.

CAMPANULACEÆ.

Campanula rotundifolia, L.; very common on Stissing Mt., Mt. Ararat, and a few high, rocky hills.—C. aparinoides, Pursh; common in our low grounds.—C. rapunculoides, L.; this immigrant is thoroughly at home in this locality; it has taken full possession of many roadsides and fields, and is becoming a worse pest to our farmers than *Linaria vulgaris*.

Specularia perfoliata, A. DC.; dry gravelly banks; quite common.

ERICACEÆ.

Gaylussacia resinosa, Torr. & Gray; common.

Vaccinium Oxycoccus, L.; Eno's Spruce Hole; Van Tassall and Fingar cranberry marshes.—V. macrocarpon, Ait.; not so frequent as preceding; marsh on Carpenter Hill, on Marshall farm; also Strever marsh, southern part of Stissing Mt.; and Fingar and Van Tassel marshes.—V. stamineum, L.; common in all our woods.—V. Pennsylvanicum, L.; common.—V. vacillans, Soland.; common.—V. corymbosum, L.; common; *Vars.*, *amœnum*, *atrococcum*, frequent.

Chiogenes hispidula, Torr. & Gr.; Eno Tamarack swamp; Sackett's Attlebury marsh.

Arctostaphylos Uva-ursi, Spreng. frequent on the naked summits of the mountains.

Epigæa repens, L.; rather common; very abundant on the N. part of Little Stissing Mt. and in adjacent woods.

Gaultheria procumbens, L.; common everywhere.

Cassandra calyculata, Don; rather common; Spruce Hole Tamarack swamp; Hot Ground marshes, etc.

Andromeda polifolia, L.; Eno's Spruce Hole; Jno. Fingar Cranberry marsh; Bingham Pond.—A. ligustrina, Muhl.; common.

Kalmia latifolia, L.; common; Muggin House Rocks.—K. angustifolia, L.; quite common; most abundant in our peat swamps. —K. glauca, Ait.; rare; Jno. Fingar Cranberry marsh; about Bingham Pond.

Azalea viscosa, L. & *Vars.* glauca and nitida; common in all our swamps.—A. nudifora, L.; common.

Ledum latifolium, Ait.; very rare; in Mulford Wheeler's *Valeriana* Swamp.

Pyrola rotundifolia, L., with two or three marked *varieties;* common.—P. elliptica, Nutt.; common.—P. chlorantha, Swartz; rather uncommon; Ham's Ravine Woods; on Stissing Mt. above Harrietta Falls, where it is very abundant.—P. secunda, L., common on N. side of Stissing Mt., and in its ravines; in most of our cold woods.

Chimaphila umbellata, Nuttall; common.—C. maculata, Pursh; very scarce about Pine Plains; it grows sparingly on the old Camp Ground, W. side of Little Stissing Mt., and I have found two or three plants on Mill Hill.

Monotropa uniflora, L.; common.—M. Hypopitys, L.; not very common; the *Var. rubra*, is more common than the typical form; Husted Woods, Mill Hill; Ostrander Forest, S. part of Stissing Mt.

AQUIFOLIACEÆ.

Ilex monticola, Gray; about ravines on Rhinebush Mt., one of the Taghkanic Range. [*extra-limital*] In moist grounds southern part of Stissing Mt.—I. verticillata, Gray; common in all our swamps.—I. lævigata, Gray; not common; Stissing Pine Swamp, etc.

Nemopanthes Canadensis, DC.; common in all our swamps; Spruce Hole; Pine Swamp, etc.

PLANTAGINACEÆ.

Plantago major, L.; very common.—P. lanceolata, L.; common.

PRIMULACEÆ.

Trientalis Americana, Pursh; rather common; Pine Swamp; Mill Hill, etc.

Lysimachia thyrsiflora, L.; frequent; Stissing Point; R. R. swamp, East of Ten Eyck's and in most of the deep, cold swamps.—L. stricta, Ait.; common.—L. quadrifolia, L.; common.—L. ciliata, L.; very common in all low grounds.—L. lanceolata, Walt.; rare about Pine Plains.—L. nummularia, L.; fully naturalized in many places; south end of Stissing Pond; along Furnace Brook, above Silvernail Bridge, etc.

Anagallis arvensis, L.; not common; along roadside, by Roelif Jansen's Kill, near Jackson Corners (*G. M. Wilber*); along banks of Shekomeko, near its mouth.

LENTIBULACEÆ.

Utricularia vulgaris, L.; common in our ponds and pools.—U. minor, L.; in Marshall Cranberry Marsh, on Carpenter Hill. —U. cornuta, Michx.; Jno. Fingar Cranberry Marsh, and in marsh along Van Tassel Pond.

OROBANCHACEÆ.

Epiphegus Virginiana, Bart.; common under beech trees; Hoffman's Beech swamp; Rudd Ravine, etc.

Aphyllon uniflorum, Torr. & Gray; rather common; Little Stissing Mt.

SCROPHULARIACEÆ.

Verbascum Thapsus, L.; common.—V. Blattaria, L.; quite common along our railroads and roadsides.

Linaria vulgaris, Mill.; very abundant, but not so common as it was 20 years ago, as it seems to be running out in many old fields and places.

Scrophularia nodosa, L.; rather common.

Chelone glabra, L.; common.

Mimulus ringens, L.; common.

Gratiola Virginiana, L.; common in wet places.

Ilysanthes gratioloides, Benth.; common in moist sandy places; bottom of Thomas' old mill dam, etc.

Veronica Virginica, L.; common in our meadows and in rich copses along our streams.—V. Anagallis, L.; quite common; along streams, brooks, etc.—V. Americana, Schwein.; common.—V. scutellata, L.; common; Keller Swamp Hole, along west road. —V. officinalis, L.; common in dry fields and open woods; Roxbury and School-house woods.—V. serpyllifolia, L.; common. —V. peregrina, L.; common.—V. arvensis. L.; quite common.

Gerardia purpurea, L.; scarce; in Tripp's Wild Lands, south of Pulver Corners.—G. tenuifolia, Vahl.; common.—G. flava, L.; common; Snake Hill woods, etc.—G. quercifolia, Pursh; more common than preceding; Snake Hill and all open woods.—G. pedicularia, L.; not very common; Slate Hills, N. of village and S. part of Stissing Mt.

Pedicularis Canadensis, L.; common.

Melampyrum Americanum, Michx.; common.

VERBENACEÆ.

Verbena angustifolia, Michx.; rather common; Burnap limestone fields; Turpin fields and on Dr. Peck's farm near Stissing. In this section it is found only on limestone land.—V. hastata, L.; common.—V. urticifolia, L.; common.

Phryma Leptostachya, L.; common.

LABIATÆ.

Trichostema dichotomum, L.; very common on our sandy land near the village.

Mentha viridis, L. common; abundant along the Shekomeko.—M. piperita, L.; quite common; along Stissing Pond.—M. arvensis, L.; rare; in Ham's fields.—M. Canadensis, L.; common along all our streams.

Lycopus Virginicus, L.: not very common; about pond holes in Strever meadows.—L. rubellus, Moench; not common; along Roelif Jansen's Kill.—L. sinuatus, Ell.; common.

Pycnanthemum incanum, Michx.; common in all our rocky woods. —P. lanceolatum, Pursh; rather common; Thompson's Marsh along Wappengers Ck.

Origanum vulgare, L.; very common in this region. It seems to flourish in a dry, calcareous soil. Our rocky, limestone fields, hills and woods for many miles hereabouts, are completely overrun with this plant, and it has become—laying aside its real prettiness—a great pest to farmers on this kind of land.

Calamintha Clinopodium, Benth.; quite common along borders of woods and fields.

Hedeoma pulegioides, Pers.; very common.

Collinsonia Canadensis, L.; common.

Blephilia hirsuta, Benth.; rather abundant along Roelif Jansen's Kill; in Bush Swamp, ½ mile above Silvernail bridge, growing with *Hypericum pyramidatum.*

Lophantus nepetoides, Benth.; quite rare; along roadside by Germond place, ½ mile S. E. of Attlebury—L. scrophulariæfolius, Benth.; rather common; along fences, near Thomas' mill; east base of Mt. Ararat; along base of Hunting Hill, etc.

Nepeta Cataria, L.; common.—N. Glechoma, Benth.; not scarce; along Shekomeko, near Carman's mill, etc.

Physotegia Virginiana, Benth.; running wild along roadsides and about yards.

Brunella vulgaris, L.; common.

Scutellaria galericulata, L.; common.—S. lateriflora, L.; common.

Marubium vulgare, L.; scarce, etc.

Galeopsis Tetrahit, L.; quite scarce; along roadside, and in Wheeler's Swamp, near Pulver Corners.

Leonurus Cardiaca, L.; common.

Lamium amplexicaule, L.; quite common in cultivated grounds; Hoff. Strever's fields around barn.

BORRAGINACEÆ.

Echium vulgare, L.; quite rare at present, but is becoming more frequent every year.

Symphytum officinale, L.; well naturalized; Robt. Rowe Ravine.

Myosotis verna, Nutt.; rather common on Little Stissing,—along road to Notch.

Cynoglossum officinale, L; common.—C. Virginicum, L.; rare on W. side of Stissing Mt. near Harrietta Falls,—the only detected habitat.—C. Morrisoni, DC.; pretty common; N. end of Little Stissing.

CONVOLVULACEÆ.

Ipomœa purpurea, Lam.; running wild about some yards.

Calystegia sepium, R. Br.; very common.—C. spithamæa, Pursh; common; along base of Little Stissing, etc.

Cuscuta Gronovii, Willd.; common.

SOLANACEÆ.

Solanum Dulcamara, L.; common.—S. nigrum, L.; rare; along Stissing Pond, below Engelke's yard.

Physalis Philadelphica, Lam; around Carman's old mill.—P. viscosa, L.; common.

Lycium vulgare, Dunal.; becoming naturalized.

Datura Stramonium, L.; common along roadsides and about old barn yards.

GENTIANACEÆ.

Gentiana quinqueflora, Lam.; scarce; along south bank of Roelif Jansen's Kill, below Silvernail Falls; in fields, towards Boston Corner.—G. crinita, Froel.; common, both in our woods and marshes; abundant on North side of Mill Hill.—G. Andrewsii, Griseb.; common in wet glades and along the principal streams.

Bartonia tenella, Muhl.; not very common; abundant in Eno Tamarack Swamp; Miller and Van Tassel cranberry marsh swamps.

Menyanthes trifoliata, L.; not rare in our marshes; Hoysradt Marsh; Carpenter Hill Marsh, and in Drowned Lands above Hot Ground.

APOCYNACEÆ.

Apocynum androsæmifolium, L.; common.—A. cannabinum, L.; frequent, but not so common as preceding species.

Asclepiadaceæ.

A. Cornuti, Decaisne; common.—A. phytolaccoides, Pursh, not common; along east base of Mt. Ararat, etc.—A. purpurascens, L.; rare; in moist glades on Stissing Mt.—A. quadrifolia, Jacq.; common in our dry woods.—A. incarnata, L.; very common in wet places and along streams.—A. obtusifolia, Michx.; scarce; along roadside N. of village! (*G. M. Wilber*)—A. tuberosa, L; rather frequent; South part of Ten Eyck Hill; southern part of Stissing Mt.; in open fields. —A. verticillata, L.; very rare; S. W. of summit of Little Stissing—the only station detected.

Oleaceæ.

Ligustrum vulgare, L.; scarce; in copses west of Stissing.

Fraxinus Americana, L.; common.—F. pubescens, Lam.; rather uncommon.—F. sambucifolia, Lam.; common in the swamps; Peck's Swamp.

Aristolochiaceæ.

Asarum Canadense, L.; common; East side of Mill Hill and Risedorf Hill.

Phytolaccaceæ.

Phytolocca decandra, L.; common.

Chenopodiaceæ.

Chenopodium album, L.; very common.—C. hybridum, L.; common.—C. ambrosioides, L.; around L. Smith's barnyard. (*G. M. Wilber.*)

Atriplex patula, L.; roadsides in village of Pine Plains, near Pell's buildings.

Amarantaceæ.

Amarantus paniculatus, L.; about some gardens.—A. retroflexus, L.; rather common.—A. albus, L.; very common.

Polygonaceæ.

Polygonum orientale, L.; along Shekomeko Ck., above Milton Smith's place.—P. Pennsylvanicum, L.; common; E. shore of Stissing Pond, etc.—P. incarnatum, Ell.; not uncommon; along Shekomeko Ck. and Jansen's Kill.—P. Persicaria, L.; very common.—P. Hydropiper, L.; very common.—P. acre, H. B. K.; frequent.—P. hydropiperoides, Michx.; rather frequent.—P. amphibium, L.; *Var.* aquaticum, Willd.; common; along new road across Stissing Pond, etc.; *Var* terrestre, Willd.; rather common; east side of Hoysradt Marsh and along Wappingers Ck.—P. Virginianum, L.; common in all our rich dry swamps.—P. aviculare, L.; very common; *var.* erectum, Roth.; common.—P. tenue, Michx.; common on our gravelly banks. —P. arifolium, L.; common in cold swamps; Hoffman's Beech Swamp.—P. sagittatum, L.; very common.—P. Convolvulus, L.; common.—P. cilinode, Mich.; on Stissing Mt.—P. dumetorum, L., *Var.* scandens, Gray; common.

Fagopyrum esculentum, Mœnch. in copses and waste places.

Rumex orbiculatus, Gray; frequent in many of our deep swamps. —R. verticillatus, L.; quite rare.—R. crispus, L.; very common. —R. obtusifolius, L.; common.—R. acetosella, L.; very common.

LAURACEÆ.

Sassafras officinale, Nees. ; common.

Lindera Benzoin, Meisner ; rather common on Mountain and elsewhere.

THYMELEACEÆ.

Dirca palustris, L. ; frequent in our moist woods, but never abundant.

SANTALACEÆ.

Commandra umbellata, Nutt. ; common.

CERATOPHYLLACEÆ.

Ceratophyllum demersum, L. ; common : in some of the stations in this district the plants appear to fruit very freely.

CATLITRICHACEÆ.

Callitriche verna, L. ; not very common.—C. heterophylla, Pursh ; common,—far more so than preceding species.

EUPHORBIACEÆ.

Euphorbia maculata, L. ; common.—E. hypericifolia, L. ; common. —E. Cyparissias, L. ; along roadsides ; the waste places in Pine Plains Evergreen Cemetery are completely overrun by this weedy immigrant.

Acalypha Virginica, L. ; common.

URTICACEÆ.

Ulmus fulva, Michx. ; common.—U. Americana, L. ; common.—U. racemosa, Thomas ; not very frequent.

Celtis occidentalis, L. ; rather common on Stissing Mt. ; *Var.* crassifolia ; near Stissing, probably escaped from cultivation into copses.

Morus rubra, L. ; frequent on Stissing Mt.—M. nigra, L. ; running wild.—M. alba, L. ; this species with the preceding was largely planted 35 years ago, for the purpose of feeding silk-worms, into which enterprise—rearing silk-worms—one of the old citizens of this place embarked a large amount of capital. The trees are now everywhere springing up spontaneously.

Urtica gracilis, Ait ; common.—U. dioica, L. ; sparingly introduced.

Laportea Canadensis, Gaud. ; common along the large streams, and in all our moist rich woods.

Pilea pumila, Gray ; very common.

Bœhmeria cylindrica, Willd. ; very common.

Cannabis sativa, L. ; scarce,—waste grounds of Evergreen Cemetery ; occasionally found in alluvial lands of Leander Smith, etc., along Wappinger's Creek. It was many years ago largely cultivated for manufacturing purposes on some of these grounds. (*G. M. Wilber.*)

Humulus Lupulus, L. ; common,—along Roelif Jansen's Kill and the other creeks ; also on Stissing Mt. and along the border of the large swamps. It is certainly indigenous in Pine Plains.

PLATANACEÆ.

Platanus occidentalis, L. ; common.

JUGLANDACEÆ.

Juglans cinerea, L. ; common.—J. nigra, L. ; quite common.

Carya alba, Nutt. ; very common.—C. tomentosa, Nutt. ; rather common in the upland woods.—C. porcina, Nutt.; common everywhere.—C. amara, Nutt.; not frequent in our swamps.

CAPULIFERÆ.

Quercus alba, L.; common.—Q. bicolor, Willd.; common.—Q. Prinus, L.; scarce on southern part of Stissing Mt.; *Var.* monticola, Michx.; common on Stissing Mt. and the upland woods.—Q. prinoides, Willd.; abundant on Stissing Mt., Mill Hill, etc.—Q. ilicifolia, Wang.; common.—Q. coccinea, Wang.; common; *Var.* tinctoria; not scarce.—Q. rubra, L.; common.—Q. palustris, Du Roi; not very frequent.

Castanea vesca, L.; very common.

Fagus ferruginea, Ait.; common.

Corylus Americana, Walt.; common.—C. rostrata, Ait.; common on Mountain, and borders of rocky woods.

Ostrya Virginica, Willd.; common.

Carpinus Americana, Michx.; very common.

MYRICACEÆ.

Myrica Gale, L.; rather uncommon; along Wappinger's Creek, Husted and Sackett marshes; abundant around Grass Pond on Mountain.

Comptonia asplenifolia, Ait.; common.

BETULACEÆ.

Betula lenta, L.; common.—B. lutea, Michx., f.; quite common; abundant in many of the moist woods, and particularly in the deep ravines of the Mountain.—B. alba, *Var.* populifolia, Spach.; very common.—B. papyracea, Ait; decidedly common; the prevailing *White Birch* on Stissing Mt., and on many of our other high cold hills.—B. nigra, L.; not frequent; along one or two of our large creeks; Roelif Jansen's Kill.—B. pumila, L.; marsh west of Croghan Hill; Wappinger's marshes; marsh along R. R. track, N. E. of Leander Smith's place; Marshall's Cranberry Marsh, on Carpenter Hill, etc. This rare species is very abundant in the *great* marshes and bogs about Pine Plains, and its haunts, or habitats, are usually those of *Valeriana sylvatica*, *Lobelia Kalmii*, Cypripedium spectabile, etc. Like *Valeriana sylvatica* of these marshes, it here generally assumes a very luxuriant form, frequently growing to the height of 12 to 15 ft., but averaging usually from 6 to 10 ft.

Alnus incana, Willd.; common; abundant along our ponds, streams and in our cold swamps.—A. serrulata, Ait.; rather more common than preceding; the two species are very easily distinguished from each other, even after the leaves have fallen, by the different appearance of their bark.

SALICACEÆ.

Salix candida, Willd.; abundant in all the bogs and marshes in which *Valeriana* is found.—S. humilis, Marshall; common in all our dry woods.—S. discolor, Muhl.; common.—S. sericea, Marshall; quite common; along sandy banks of Trout Brook, Shekomeko Creek, etc.—S. cordata, Muhl.; common.—S. livida, Wahl., *Var.* occidentalis, Gray; rather common.—S. lucida, Muhl.; common along the creeks and smaller streams.—S.

nigra, Marsh.; along Roelif Jannsen's Kill.—S. alba, L., and *Var.* vitellina; the variety is very common along the streams, and elsewhere,—probably mostly planted in these places.—S. Babylonica, Tourn.; common in cultivation,—still I know of no instance in which it has really run wild.—S. myrtilloides, L.; sparingly found in a large peat bog on southern part of Stissing Mt.

Populus tremuloides, Michx.; common.—P. grandidentata, Michx.; rather common.—P. heterophylla. L. (?); swamp by Roelif Jansen's Kill.—P. balsamifera, L.; *Var.* candicans, and P. alba, L., are spreading widely by the root in this region.—P. dilatata, Ait.; still found about many old homesteads, the offspring from the plantings of the early Dutch settlers.

CONIFERÆ.

Pinus rigida, Miller; common.—P. strobus, L.; common.

Abies nigra, Poir.; not rare; Eno Spruce Hole; Croghan Hill Marsh, etc.—A. Canadensis, Michx.; common.—A. balsamea, Marshall; frequent on Stissing Mt., and a few of our other wooded hills.

Larix Americana, Michx.; rather common.

Thuja occidentalis, L.; quite abundant towards the Hudson River, but not found immediately about Pine Plains.

Juniperus communis, L.; frequent in all of our woods.—J. Virginiana, L,; common.

Taxus baccata, L., *Var.* Canadensis, Gray; rare on Stissing Mt.; not scarce on Mt. Riga.

ARACEÆ.

Arisæma triphyllum, Torr.; common.—A. Dracontium, Schott.; rather scarce; Thomas meadow, along Shekomeko; below Silvernail Falls.

Peltanda Virginica, Raf.; common.

Symplocarpus foetidus, Salisb.; common.

Acorus Calamus, L.; common.

LEMNACEÆ.

Lemna trisulca, L.; scarce; pool by Wappinger's Creek, in Teneyck's meadow.—L. minor, L.; common.—L. polyrrhiza, L.; common.

TYPHACEÆ.

Typha latifolia, L.; common.

Sparganium eurycarpum, Engelm.; not common; in ditches in Wappinger's marsh.—S. simplex, Huds.; common.

NAIADACEÆ.

Naias flexilis, Rostk.; common.

Zannichellia palustris, L.; common in nearly all the streams and ponds; Wappinger's Creek, by Thompson Bridge.

Potamogeton natans, L.; common.—P. Oakesianus, Robbins; Thompson Pond, near inlet.—P. Claytonii, Tuckerm.; rare; pool by R. R., Attlebury Hill.—P. lonchites, Tuckerm.; rather common; abundant in Wappinger's Creek. etc.—P. amplifolius, Tuckerm.; not scarce; abundant at N. end of Stissing Pond, etc. —P. gramineus, L., common; Wappinger's Creek.; Hoffman

Hoysradt Pond Marsh, S. end; *Var.* heterophyllus, *Sub-var.* minor, Robbins, above outlet of Mud Pond.—P. lucens, L.; common in all our ponds, Stissing, Halcyon, Thompson, Miller, etc., but *Var.* minor, is still more common.—P. prælongus, Wulfen; rather common; N. W. of islands, Mud Pond; Stissing Pond.—P. perfoliatus, L.; rare in one or two of the ponds.—P. compressus, L.; quite common; abundant in Stissing Pond; Wappinger's Creek, near Attlebury Station.—P. obtusifolius, Merts. & Koch.; rather scarce; Hoffman Mill Pond and old channel of Shekomeko, below the mill.—P. pauciflorus, Pursh; very common in all our ponds, etc., but exceedingly variable.—P. pusillus, L.; rather uncommon; N. end of Mud Pond, etc.—P. pectinatus, L.; not common; N. E. end of Thompson Pond; N. part of Stissing Pond.—P. Robbinsii, Oakes; very common in some of our ponds,—Mud, Halcyon, Stissing, Miller, etc.—For the correct determination of this genus, I am greatly indebted to Dr. J. W. Robbins of Uxbridge, Mass., who has kindly looked through a full suite of specimens from this district.

ALISMACEÆ.

Triglochin palustre, L.; very rare; only a single specimen in Sackett's Marsh.

Scheuchzeria palustris, L.; rare, but abundant about Bingham Pond on Mountain.

Alisma Plantago, L., *Var.* Americanum, Gray; common.

Sagittaria variabilis, Engelm.; common, with *Vars.* obtusa, latifolia, hastata (ordinary form), diversifolia, angustifolia and gracilis, frequent.

HYDROCHARIDACEÆ.

Anacharis Canadensis, Planchon; not common.

Vallisneria spiralis, L.; common; Mud Pond.

ORCHIDACEÆ.

Orchis spectabilis, L.; not scarce; Barton Woods, Mill Hill; Jno. A. Thompson Woods; abundant along stream above Harrietta Falls, Stissing Mt.

Habenaria tridentata, Hook.; frequent about swampy places, southern part of Stissing Mt., along East Ravine opening into Mulberry Meadow Swamp, with *Botrichium Matricariæfolium*, and *B. lanceolatum*.—H. virescens, Spreng.; abundant in swamps southern part of Stissing Mt.—H. viridis, R. Br., *Var.* bracteata, Reichenb.; very scarce; I have found only a few specimens along a stream, on south-eastern part of Stissing Mt. —H. hyperborea, R. Br.; rather common on N. side of Little Stissing, and in our wet cold woods.—H. Hookeri, Torr.; rather common, particularly on west side of Stissing Mt., under the hemlocks.—H. orbiculata, Torr.; rare; Deep Woods, near Silvernail Falls.—H. lacera, R. Br.; common; abundant in meadow, E. of N. end of Stissing Pond.—H. psycodes, Gray; common in the wet meadows, and swamps, particularly on Stissing Mt.—H. fimbriata, R. Br.; very rare; wet glade below Silvernail Falls, station now destroyed by freshet.

Goodyera pubescens, R. Br.; not rare; Stissing Mt.; very abundant in Briggs' Woods, beyond Bethel.

Spiranthes latifolia, Torr.; not common: S. end of Thompson Pond with *Ophioglossum vulgatum;* along Trout Brook and Hoysradt Marsh.—S. cernua, Richard.; common,—S. gracilis, Bigel.; not common, but abundant in Ham's Ravine Woods, and open places, Stissing Mt.—S. simplex, Gray; rare; Ham's Ravine Woods.—(*G. M. Wilber and L. H. H.*)

Arethusa bulbosa, L.; very rare; only a few specimens in L. Smith's bog, *G. M. W.*; in Cranberry Marsh, along Van Tassel Pond, June, 1878.

Pogonia ophioglossoides, Nutt.; rather common; Fingar Cranberry Marsh; Drosera Swamp, S. E. of Attlebury, etc. This plant appears almost always to be accompanied by *Calopogon pulchellus.*—P. verticillata, Nutt.; rather scarce; abundant on Stissing Mt. about Mulberry Meadow, but very seldom found in flower; the plants appear to be sterile.

Calopogon pulchellus, R. Br.; quite common; in same localities with *Pogonia ophioglossoides.*

Microstylis monophyllos, Lindl.; with Lipparis Loeselii, in swamp in G. Lasher's *Jno. Fingar* Woods, Gallatin, June, 4, 1878.—M. ophioglossoides, Nutt.; rare; in and about Moss Flat, southwest of Harrietta Falls, Stissing Mt.; Geo. Rowe Woods, Gallatin.

Liparis liliifolia, Richard.; frequent on N. end of Stissing Mt.—L. Lœselii, Richard.; very rare; only detected in Pet. Lasher's Swamp.

Corallorrhiza odontorrhiza, Nutt.; sparingly found in several of our woods; Ham's Ravine Woods.—C. multiflora, Nutt.; common on mountain, and in all our woods.

Aplectrum hyemale, Nutt.; this plant, I have never found in Pine Plains, but I have good authority for its being found here frequently, thirty and more years ago, in some of our large swamps, by the botanic physicians and others; those swamps have since been largely cut away and partially drained and the plant may now be exterminated, for high cultivation is certainly the bane to many of the rarest and shyest plants of our native flora. Another cause of its rapid extermination here may arise from its being eagerly sought after by the vulgar and simple-minded, in early times, on account of its reputed properties as a philter.

Cypripedium parviflorum, Salisb.; common; Mill Hill, Risedorf Hill, etc.—C. pubescens, Wild.; not so common; swampy grounds on Stissing Mt.—C. spectabile, Swartz; rather common; abundant in Tamarack Swamp near Halstead Station; Pogonia Swamp, S. E. of Attlebury; Tamarack Swamp W. of Croghan Hill, Drowned Lands, etc.—C. acaule, Ait.; rather common on upper and southern parts of Stissing Mts. and in a few of the rich woods and swamps.

AMARYLLIDACEÆ.

Hypoxys erecta, L.; common.

IRIDACEÆ.

Iris versicolor, L.; common.

Sisyrinchium Bermudiana, L.; common.

DIOSCOREACEÆ.

Dioscorea villosa, L.; westward towards the Hudson River, but extra-limital.

SMILACEÆ.

Smilax rotundifolia, L.; scarce; abundant in a few swamps on southern part of Stissing Mt.—S. herbaccea, L.; common.

LILIACEÆ.

Trillium erectum, L.; common; *Var.* album, Pursh; R. Peck's Swamp along D. & C. R. R., ¾ mile S. W. of village.—T. cernuum, L.; not common, but very abundant along Wappinger's Creek, in L. Smith's Nut Swamp; Thomas Meadow, along Shekomeko Ck.—T. erythrocarpum, Michx.; quite frequent on Mt. Riga.

Medeola Virginica, L.; common, especially around swamps on Mountain.

Veratrum viride, Ait; common.

Chamælirium luteum, Gray: rather common; Davis Lot, Mill Hill; Snake Hill; S. W. of Stissing Mt., etc.

Uvularia grandiflora, Smith; very rare; along brook, in woods, 1½ miles S. W. of Hot Ground.—U. perfoliata, L.; common.—U. sessilifolia, L.; very common in some meadows and low woods.

Streptopus roseus, Michx.; frequent in ravines on Winchell Hill with *Phegopteris polypodioides* and *P. Dryopteris;* common on Mt. Riga.

Clintonia borealis, Raf.; very rare on Stissing Mt.; abundant on Mt. Riga.

Smilacina racemosa, Desf.; common.—S. stellata, Desf.; not rare; Peck's Swamp, S. E. part; swamp E. of Jno. Titus Place; Drowned Land swamps, etc.—S. trifolia, Desf.; very rare; found only in a bog east of Mt. Riga Pond.—S. bifolia, Ker.; very common.

Polygonatum biflorum, Ell.; common.—P. giganteum, Dietrich; rather common; abundant along Shekomeko Ck.; Thomas Meadow; Roelif Jansen's Kill, etc.

Asparagus officinalis, L.; frequent; apparently fully naturalized in a few of our open rocky woods; also in waste places.

Lilium Philadelphicum, L.; common; top of Risedorf Hill and in all our open woods and on Mountain.—L. Canadense, L.; very common in all meadows and moist situations.—L. superbum, L.; rare; along Shekomeko Ck.

Erythronium Americanum, Smith; common.

Ornithogalum umbellatum, L.; sparingly run wild.

Allium tricoccum, Ait.; common; E. base of Risedorf Hill; below Silvernail Falls, etc.—A. vineale, L.; only sparingly introduced.—A. Canadense, Kalm; common; along Shekomeko Ck., Thomas Meadow, etc. In crevices of bare rocks, southern part of Stissing Mt.

Muscari botryoides, Mill.; along N. shore of Halcyon Lake.

Hemerocallis fulva, L.; roadsides and waste places.

JUNCACEÆ.

Luzula pilosa, Willd. ; quite rare; in Ham's Ravine Woods and along Furnace Brook, above Silvernail Bridge.—L. campestris, DC. ; common.

Juncus effusus, L. ; very common in our swamps and marshes.—J. marginatus, Rostk. ; not rare ; below inlet of Thompson Pond, etc.—J. bufonius, L. ; not frequent ; in meadow road, by Shekomeko bridge, Milton Smith Place ; Hunting Hill.—J. tenuis, Willd. ; very common. –J. pelocarpus. E. Meyer ; quite rare, N. shore of Thompson Pond ; common along Mt. Riga Pond.—J. articulatus, L. ; along streams E. of Mt. Riga.—J. accuminatus, Michx. ; along Poughkeepsie R. R., above Stevens's Grove ; by Fowler Spring, Little Stissing Mt., etc.—J. nodosus L. ; common ; Wm. Simmon's Mountain Meadow ; Stissing Pd., S. meadow, etc.—J. Canadensis. J. Gay ; common : *Var.* longicaudatus, Englm. ; rather common ; W. shore of Stissing Point ; Mt. Riga Pond, etc. : *Var.* brachycephalus, Englm. ; not rare ; Drowned Land marshes, with *Valeriana sylvatica* ;--also, more contracted, in Bryant Hoysradt Marsh and W. of Stissing Point with preceding variety : *Var.* coarctatus, Englm. ; not found on the low lands of Pine Plains, but very abundant in moist ground on the mountains, particularly along shores of Mt. Riga Pond.

Thanks are due to Dr. Geo. Engelmann, of St. Louis, for his revision of my determinations in this somewhat puzzling genus.

PONTEDERIACEÆ.

Pontederia cordata, L. ; very abundant in most of the ponds : *Var.* angustifolia, Torr., in Drowned Lands and Bryant Hoysradt marshes.

Schollera graminea, Willd. ; rather common ; along E. shore of Stissing Point, Stissing Pond, etc.

XYRIDACEÆ,

Xyris flexuosa, Muhl., Chapman ; rare ; Grass Pond, Mt. Riga : *Var.* pusilla, Gray, abundant along borders of Bingham Pond.—X. Caroliniana, Walt, ; frequent ; Jno. Fingar Cranberry Marsh ; Van Tassel Pond Marsh, and borders of Round Pond, Stanford.

ERIOCAULONACEÆ.

Eriocaulon septangulare, With. ; common ; Mud Pond ; along muddy shores of Mt. Riga Pond, its usual height is only one to two inches.

CYPERACEÆ.

Cyperus diandrus, L. ; quite common ; with *C. inflexus*, Thomas Mill-pond, etc.—C. inflexus, Muhl. ; quite abundant about Thomas' Old Mill-pond, Shekomeko Ck., the only habitat of this fragrant little galingale I have discovered.—C. dentatus Torr. ; rarely found in some of our large sandy swamps.—C. phymatodes, Muhl. ; along Roelif Jansens Kill.—C. strigosus, L. ; common —C. Michauxianus, Schultes, quite common ; Round Pond ; Stissing Pond, etc.—C. filiculmis, Vahl. ; grows quite plentiful in sandy fields near Mt. Riga.

Dulichium spathaceum, Pers.; common along shores of our ponds and in swamp holes.

Eleocharis Robbinsii, Oakes; abundant above outlet of Mud Pond, 1878.—E. obtusa, Schultes; common.—E. olivacea, Torr.; Cherrytree Point, W. shore of Thompson Pond: Little Mud Pond.—E. palustris, R. Br.; very common; var. glaucescens, Pulver Corner marshes.—E. intermedia, Schultes; not common; Thomas' Old Mill-pond and Thompson Pond.—E. tenuis, Schultes; frequent; Thompson Meadow; Fingar Marsh.—E. acicularis, R. Br.—very common along shores of ponds and in our large wet swamps.

Scirpus planifolius, Muhl.; common on many of the wooded hills, Stissing Mt., Mill Hill, Risedorf Hill, etc. This pretty cæspitose species grows most abundant on limestone land—very sparingly with us: is it found on other soils?—S. subterminalis, Torr.; abundant in Lee Pond, Mt. Riga.—S. pungens, Vahl.; common along Stissing and Thompson ponds.—S. Torreyi, Olney; along east side Mt. Riga Pond.—S. validus. Vahl.; very common.—S. Smithii, Gray; this somewhat local species grows plentiful along shores of Stissing Pond, particularly below boat landing.—S. fluviatilis, Gray; in a large pond hole on the *Jno. Rowe* Hoystadt Farm, near C. Turpin Place; very stout and tall, 4 to 6 ft. high.—S. atrovirens, Muhl.; common.—S. polyphyllus, Vahl.; not common; Furnace Brook Swamp, etc.—S. Eriophorum, Michx.; common, also its *varieties*.—Pulver Corner marshes, etc.

Eriophorum Virginicum, L.; not uncommon; Bryant Hoysradt Marsh, and swamps on Stissing Mt.—E. polystachyon, L. common; Eno's Spruce Hole, etc.; both *Vars. angustifolium* and *latifolium* are found in our large marshes and peat-bogs.—E. gracile, Koch., *Var.* paucinervium, Engelm.; not common; Carpenter Hill Cranberry Marsh, etc.

Fimbristylis autumnalis, Rœm. & Schult.; not common; Thompson Pond, with *Eleocharis olivacea.*—F. capillaris, Gray; common.

Rhyncospora fusca, Rœem & Schult.; rather common; along borders of Round Pond, Stanford; very abundant about Bingham and Mt. Riga Ponds —R. alba, Vahl.; common in all of our marshes.—R. capillacea, Torr.; quite common; abundant in centre of Hoag Pond Marsh, W. of Risedorf Hill; South Pulver Corner marshes; Bryant Hoysradt Marsh, etc.—R. glomerata, Vahl.; rare in vicinity of Pine Plains; grows plentiful about Lee Pond, and on some parts of Mt. Riga.

Cladium mariscoides, Torr.; common; along Thompson and Stissing Ponds, etc.

Scleria pauciflora, Muhl.; this rare *Nut-Rush* I detected the past season (1878) growing quite plentiful in dry, sterile, rocky ground on south part of Stissing Mt.; its arboreous companions are mainly the Rock Oak and Pitch Pine.

Carex, L.

C. polytrichoides, Muhl.; common.

C. Wildenovii, Schk.; not common; S. part of Burnap's School Woods; Little Stissing Mt.; Pond Hill, Lake Charlotte.

C. bromoides, Schk.; common; swamp in Notch of Stissing Mt.; Peck's Swamp, etc.

C. teretiuscula, Good.; common; Bryant Hoysradt Marsh, etc. —Var. Major Koch; not rare; also in Hoysradt Marsh; Sackett's Attlebury Marsh and Tamarack Swamp, Stanford.

C. vulpinoidea, Mich.; very common.

C. stipata, Muhl.; common, in swamps and along streams.

C. xlopecoidea, Tuckerman; this sedge found very sparingly in Western New York, and Pennsylvania to Michigan, etc., I detected the past season (1878) growing in Thomas Meadow, along the Shekomeko Creek. This detection brings the range of this sedge to the extreme eastern part of the State.

C. sparganioides, Muhl.; common; E. side Risedorf Hill, Strever's Grove, etc.

C. cephalophora, Muhl.; common in all our woods.

C. Muhlenbergii, Schk.; rare, but abundant on south slope of Little Stissing.—Var. enervis, Boott; Wilber Meadow Hill, near Rich. Ham's place.

C. rosea, Schk; common.—Var. minor, Boott; Peck's Swamp.—Var. radiata, Dew.; Stissing Mt. Swamps; Bash-Bish Falls.

C. retroflexa, Muhl.; rather common; Mill Hill; road to Notch, Stissing Mt., etc.

C. tenella, Schk.; not common, but abundant along Strever's Swamp, S. end of Stissing Mt. and in other swamps on mountain; Fingar Swamp, with *Liparis Læselii*, *Microstylis monophyllos*, and *Cypripedium spectabile*; also in Mt. Riga swamps.

C. trisperma, Dew.; common in all our large swamps; Eno's Tamarack Swamp, etc.

C. canescens, L.; quite common in most of our swamps; Notch Swamp on Mountain.

C. vitilis, Fries; Stissing Mt. rare, but abundant near summit of Mt. Riga.

C. Deweyana, Schw.; rare, in copses along Roelif Jansen's Kill.

C. sterilis, Willd.; rather common; Jno. Righter meadow, S. W. of hill, etc.

C. echinita, Murray, Var. scirpoides, Boott, (C. stellulata, var. scirpoides,) common; swamps and wet places along the Shekomeko, etc.

C. scoparia, Schk.; very common.

C. lagopodioides, Schk.; common; Peck's Swamp.

C. cristata, Schw.; common.—Var. mirabilis, Boott, rather common; generally in copses and along fence borders.

C. Bebbii, Olney; in a large dryish marsh, near Attlebury, with *C. alata*—although a good *C. Bebbii* Mr. Wm. Boott would refer it to *C. cristata*, regarding *C. Bebbii* as probably only a form of the other.

C. adusta, Boott; frequent in a number of our woods, certainly not rare; S. W. part of Stissing Mt.; Groper Hill; Ludlow Woods, Stanford.—Var. argyrantha, on Stissing Mt., and at Bash-Bish Falls.

C. fœnea, Willd.; found growing abundantly this past season on a cold slope near summit of Mt. Riga. It is quite remarkable for this maritime species to be found so far inland—90 miles from N. Y. City—and growing in such a situation.

C. tenera, Dew.; frequent; Peck's Swamp by D. & C. R. R., etc.—Var. major, Olney, (*C. straminea*, var. *aperta*, Boott) rare, near Mountain summit.

C. straminea, Schk.; Var. typica; quite rare; in *Scirpus fluviatilis* pond field.—Var. minor, Dew.; scarce, Fingar Woods.—Var. Crawei, Boott; rather common, on ledges, N. W. of Notch Swamp, and elsewhere on Stissing Mt.; Strever Hill Field near Carskaden Woods.

C. alata, Torr.; this southern sedge I detected the past season (1878) in Sackett's Attlebury Marshes, near base of Stissing Mt. about four miles from Pine Plains.

C. vulgaris, Fries; rare; in cold wet places on Mt. Riga.

C. aquatilis, Wahl.; not common; along E. side of Drowned Lands, above Halstead Station; Dakin Marsh, N. of Riga Station.

C. torta, Boott; quite common; along Henry Ham's Brook; Furnace Brook, above Silvernail Bridge; along Harrietta Brook on Stissing Mt., etc.

C. aperta, Boott; rare, along Bingham Pond on Mt. Riga.

C. stricta, Lam.; very common; the large tussocks, so common in many of our swamps and wild meadows, consist almost entirely of this species.—Var. strictior (Dewey), abundant in Husted Meadow, along Trout Brook.

C. crinita, Lam.; not very common: outlet of Mud Pond; L. Smith's Swamp, etc.

C. gynandra, Schw., Boott; much more common than the preceding species, which it somewhat resembles. On Stissing Mt., and Mt. Riga it is very abundant, and the prevailing species of its sub-section; abundant elsewhere in this region, in cold, springy places, as H. Ham's Brook Meadows, Wm. Simmon's meadows by Mountain.

C. limosa, L; only found in Tamarack Swamp, East Stanford, where it is quite plentiful.

C. irrigua, Smith; rare, in marshes on Taghkanic Mts.

C. Buxbaumii, Wahl.; not common; marshy meadow near Jno. Fingar's barn; Dakin Marsh, north of Riga Station.

C. aurea, Nutt.; frequent in our cold wet meadows, along D. & C. R. R. below Peck's Swamp, etc.

C. tetanica, Schk.; very common in all our marshes and meadows; Husted meadows along Trout Brook, etc.

C. granularis, Muhl.; common in the meadows.

C. glaucodea, Tuck.; this new species grows quite plentiful in open places, particularly along paths and wood roads, on southern part of Stissing Mt.; as for instance, Strever Path to May Bars.

C. pallescens, L.; common in our meadows and woods.—Var. undulata, frequent.

C. conoidea, Schk.; not rare; Silvernail Bridge Meadow; Hunting Hill Meadow and Peck Swamp Meadow.

C. grisea, Wahl.; quite common; Peck's Swamp; E. base of Risedorf Hill, etc.

C. Davisii, Schw. & Torr.; rare, but abundant along Roeliff Jansen's Kill, in low rich copses, as at Beaver Dam and Coons Crossing, Ancram.

C. formosa, Dew.; quite common; Ed. Hunting Meadows; Burnap School Woods by stream; along E. borders of Drowned Lands very abundant.

C. gracillima, Schw.; common; Peck's Swamp; Hoffman's Beech Swamp, etc.

C. æstivalis, M. A. Curtis. This rare sedge I detected the past summer growing in abundance near the summit of Mt. Riga, also near summit of Mt. Everett, Taghkanic Mts.

C. virescens, Muhl.; common; Rudd Ravine; Stissing Mt., etc. Also a peculiar form of this sedge grows copiously in low exsicated meadows with the next.

C. triceps, Michx.; common in most low woods and meadows; Clark Meadow by Stissing Pond.

C. plantaginea, Lam.; very rare; sparingly in ravines on Stissing Mt. and Mt. Riga.

C. platyphylla, Carey; common; Mill Hill.

C. retrocurva, Dew.; quite common; Burnap Woods; N. base of Hunting Hill; E. base Risedorf Hill, etc.

C. digitalis, Willd.; common; Strever's Grove; Mill Hill.

C. laxiflora, Lam.; rather common.—Var. plantaginea, Boott, N. base of Hunting Hill, etc.—Var. intermedia Boott; Mead's Run, Stanford and Spring woods, E. side Drowned Land.—Var. blanda, Boott; common.—Var. *blanda* gracillima, W Btt.; Miller's Meadow, by Lake Charlotte; near summit of Mt. Riga.—Var. latifolia. Boott; E. base Risedorf Hill, with *Solea concolor* and *Aspidium Goldianum;* Hunting Hill.

C. oligocarpa, Schk., quite rare, but abundant on south slope of Little Stissing, between Notch road and Crandell Ledge.

C. Hitchcockiana, Dew.; also not frequent, but plentiful in Spring Woods, on E. border of Drowned Lands; Brook-bank copse, below Jno. Cronkright's Saw-mill, W. Stissing Mts.

C. eburnea, Boott; rare on a few limestone ledges.

C. pedunculate, Muhl.; frequent; Tanner Woods Swamp, south of Hedges' Pond, Hot Ground; Rudd's Ravine; Ludlow Woods, Stanford.

C. umbellata, Schk.; common; Muggin House Rocks, etc.

C. Novæ-Angliæ, Schw.; rare; only detected on upper part (above Notch) of Little Stissing.

C. Emmonsii, Dew.; rather common; Muggin House Rocks; Snake Hill; etc.

C. Pennsylvanica, Lam.; common, at Stissing Notch, above barn.

C. varia, Muhl.; very common; W. side of Muggin House Rocks, etc.

C. pubescens, Muhl.; common; Peck's Swamp; Barton Woods, Mill Hill, etc.

C. miliacea, Muhl.; common, especially in moist places along streams on Stissing Mt., as in Notch Swamp, and Old Camp Ground, Little Stissing.

C. scabrata, Schw.; common with the preceding; Wm. Simmons' Spring Stream, Little Stissing, etc.

C. arctata, Boott; nor common; rare on Stissing Mt., but abundant near summit of Mt. Riga and high peaks of the Taghkanic Mts.

C. debilis, Michx.; very scarce in immediate vicinity of our village,—in a few dryish swamps south end of Stissing Mt., but the most abundant Carex in the Mt. Riga region.

C. flexilis, Rudge; the Salisbury, Ct., station of Gray's Manual for this rare sedge is only ten or twelve miles from here. I have never yet found it growing. It may probably yet be detected in our own neighborhood in some of the moist woods, as the range of this rare plant is apparently northward and westward.

C. flava, L.; very common in cold grounds; along R. R., below Ten Eyck's place.

C. Œderi, Ehrh.; quite rare, but plentiful along W. border of Bryant Hoysradt Marsh—very springy; Hoag Pond Marsh banks.

C. filiformis, L.; common; Bryant Hoysradt Marsh; Thompson Pond, etc.

C. lanuginosa, Michx.; rather common; Shekomeko Creek, near Hoffman's Beech Swamp; Mulberry Meadow Swamp, etc.

C. riparia, Curtis; not rare; along Trout Brook; Wappinger Creek Marshes; Round Pond, Stanford.

C. trichocarpa, Muhl.; rather common; abundant along Roeliff Jansen's and Shekomeko Creeks; Thomas Meadow.

C. comosa, Boott; common; along Stissing Pond, etc.

C. Pseudo-Cyperus, L.; along ponds on Mt. Riga.

C. hystricina, Willd.; very common.—Var. Cooleyi, occasionally met with.

C. tentaculata, Muhl.; very common.—Var. gracilis, Boott, frequent. —Olney's new species, C. Purshii, (C. tentaculata, var. rostrata, Sartwell), also abounds.

C. intumescens, Runge; common in our wet swamps.

C. Grayii, Carey; this is another western sedge fonnd growing at Pine Plains, the southeastern part of the state. Detected last season in the rich creek bottoms of the Roeliff Jansen's Kill, near Wm. Thompson's Place, above Ancram.

C. lupulina, Muhl.; common; S. E. part of Strever's Swamp, etc. Several forms or varieties of this sedge are found in our swamps.

C. lupuliformis, Sartwell; quite rare; Hunting R. R. Swamp, near Bethel.

C. retrosa, Schw.; common; Peck's Swamp; Ten Eyck Swamp, etc.—Var. Hartii; abundant along W. side Hunting R. R. Swamp.

C. Schweinitzii, Dew.; perhaps the most common in this region of Section *Vesicariæ*; Husted Meadow and G. & E. R. R. Bridge Swamp, Trout Brook; in *Cypipredium-spectabile* Swamp, S. E. Attlebury; swamps about Hot Ground, etc.

C. utriculata, Boott; common and very variable; Bryant Hoysradt Marsh, etc.—Var. furcata; Shaw Pond, Stanford.

C. monile, Tuck.; quite rare; in lower swamps, along road from Stissing to Summit of Mountain, in Woodin's Old Coal Field; also, in swamp on Mt. Riga.

C. Tuckermani, Boott; not common; abundant along the Roelif Jansen's Kill, near R. & C. R. R. Bridge, below Ancram; Grovenor William's Swamp-hole, towards Van Tassel Pond.

C. bullata, Michx.; only yet found in *Scirpus-fluviatilis* swamp or pond-hole, near Turpin Place.

C. longirostris, Torr. This sedge is sparingly found in the northern part of the State. I cannot find in *State Flora*, *Paine's Oneida Catalogue*, etc., that it has ever been found south of the Mohawk. *Gray's Manual* says "Northern New England to Wisconsin, and northward." I detected it last May (1878) under and on some shaded limestone cliffs, near the upper part of Snake Hill, about half a mile from the village of Pine Plains. The next month I again found a large patch of it along the Roeliff Jansen's Kill, Coons' Crossing, on old creek bottoms, near *C. Davisii* and *C. Grayii* stations.

For the accuracy of this list of Carices I am much indebted to Wm. Boott, Esq., of Boston, to whom was submitted a full suite of the Carices from this district, and who kindly revised my determinations.

GRAMINEAE.

Leersia Virginica, Willd.; common in all moist woods; Hoffman's Beech Woods, etc.—L. oryzoides, Swartz; common.

Alopecurus aristulatus, Michx.; common; Booth Swamp., etc.

Phleum pratense, L.; common.

Vilfa vaginaeflora, Torr.; rather common; sandy fields near the village.

Sporobolus serotinus, Gray; in wet meadows near Mt. Everett.

Agrostis perennans, Tuckerm.; shady places lower part of Stissing Mt.—A. scabra, Willd.; common; Eno Meadows by Wappingers Creek.—A. vulgaris, With.; common; Eno Meadows.—A. alba, L.; not common; May Bars on Stissing Mt., etc.

Cinna arundinacea, L.; common in most of our swamps:—*Var.* pendula, Gray; frequent, upper parts of Mt. Riga, Mt. Everett., etc.

Muhlenbergia sobolifera, Trin.; common; Snake Hill; Mt. Ararat, etc.—M. glomerata, Trin.; common; Hoag Pond Marsh, etc. —M. Mexicana, Trin.; common, with preceding.—M. sylvatica, Torr. & Gr.; rather common; Stissing Mt.—M. Willdenovii, Trin,; not rare; W. side of Snake Hill on cliffs; Silvernail Falls, etc.—M. diffusa, Schreber; not common, but abundant on Geo. Beckwith Orchard Hill, Stissing; also along S. E. border of Snake Hill.

Brachyelytrum aristatum, Beauv.; rather common; along swamps near Summit of Stissing Mt. etc.

Calamagrostis Canadensis, Beauv.; common in all the marshes and swamps; Hoysradt Marsh.

Oryzopsis melanocarpa, Muhl.; common; Stissing Mt.; Swamp E.

of Ten Eyck's Place, etc.—O. asperifolia, Michx. quite common on upper part of Stissing Mt.—O. Canadensis, Torr.; rather abundant about Harrietta Falls and South of Summit of Stissing Mt.; also found in Ham's Ravine Woods.

Aristida dichotoma, Michx.; common in the sandy fields about Pine Plains.

Eleusine Indica, Gaertn.; becoming common in yards; Thomas Lane by mill, etc.

Dactylis glomerata, L.: not common; shady roads on Stissing Mt.

Eatonia obtusata. Gray; rather common; Southern part of Mt. Ararat; Mill Hill; and Little Stissing Mt.—E. Pennsylvanica, Gray; common; Rudd Ravine; along Roelif Jansen's Kill, etc.

Glyceria Canadensis, Trin.; rather common; Clark Meadow Swamps near Stissing Pond; Hoysradt Marsh.—G. elongata, Trin.; not common; but very abundant in Mulberry Meadow Swamps, S. end Stissing Mt.; also in swamp near Monument Mt.—G. nervata, Trin.; very common.—G. pallida, Trin.; not rare; swamp E. of Ten Eyck's; along Ancram Creek, etc.—G. aquatica, Smith; rather common; above Miller R.R. Bridge, Ancram Creek.; old saw-mill, above Bash-Bish Falls.—G. fluitans, R. Br.; not uncommon; swamp E. of Ten Eyck's, etc.—G. acutiflora, Torr.; one of the most common species of this genus in our swamps; Booth Swamp; Peck Swamp; Keller Bog-hole, by road, ½ mile W. of village; Vosburgh Pond-hole, along R. & C. R. R., Ancram.

Poa annua, L.; not common; around Thomas Mill-pond, and sparingly elsewhere.—P. compressa L.; very common in dry fields and on rocks.—P. serotina, Ehrhart; rather common; around Keller Bog-hole, etc.—P. pratensis, L.; very common in fields and on mountains.—P. trivialis, L.; not rare; along Trout Brook, Park Meadow, etc.—P. debilis, Torr.; not common; G. Fingar Ravine, Gallatin; Rudd's Ravine; along Harrietta Falls Brook, Stissing Mt.—P. alsodes, Gray; Harrietta Falls; Fowler Spring, Little Stissing.

Eragrostis reptans, Nees.; quite rare; about Thomas Mill-pond.—E. poaeoides, Beauv., *Var.* megastachya, Gray; scarce; along roadsides W. of Jno. Righter's.—E. pilosa Beauv.; becoming common during last few years; along Race-course, Clark Land, etc.—E. capillaris, Nees.; not rare; along road to Notch, Little Stissing.—E. pectinacea, Gray; scarce; in sandy fields by Taghkanic Mts.

Briza media L.; in fields near Attlebury.

Festuca tenella, Willd.; not very common; on E. slope of Muggin House Rocks; Myer's Woods, Sudam Place.—F. elatior L.; very common everywhere, roadsides, meadows, etc.—F. nutans, Willd.; common; slope N. of Muggin House Rocks; Snake Hill; Rudd Ravine, etc.

Bromus secalinus, L.; in wheat fields.—B. mollis, L.; rare; S. end of Stissing Mt.—B. Kalmii, Gray; not common; Pogonia Swamp Meadow, near Attlebury; Snake Hill.—B. ciliatus, L.; common; L. Smith's W. Swamp; Mountain Swamps; *Var.*

purgans, (6-7 ft. high) along Shekomeko Creek, Thomas Meadow.—B. tectorum, L.; along D. & C. R. R. by Ten Eyck Swamp.

Phragmites communis, Trin.; not common; outlet of Mud Pond; Drowned Land Marsh, N. W. Croghan Hill.

Triticum repens, L.; very common.—T. violaceum, Hornemann; not rare in this region; on ledges, S. S. E. of May Bars, Stissing Mt.; Ledges W. side Snake Hill; on rocks above Grass Pond, Mt. Riga, etc.—T. caninum, L. (?) on slope of Mt. Ararat.

Elymus Virginicus, L.; common; along Shekomeko Creek., Thomas Meadow, etc.—E. Canadensis, L.; common; with preceding along Shekomeko Ck.; along Roelif Jansen's Kill, etc.—E. striatus, Willd.; not uncommon; Thomas Meadow, along bank, W. of Jno. Cronk Saw-mill near Stissing; West Woods, Tanner Farm, Bethel.

Gymnostichum Hystrix, Schreb.; common; Jno. A. Thomson Woods, etc.

Danthonia spicata Beauv.; common everywhere in dry, sterile soil; Mt. Ararat, etc.—D. compressa, Austin; common along shady roads on Mt. Riga—to Grass Pond; also abundant in Notch near Mt. Everett. This species seem to require moister soil than *D spicata.*

Avena striata, Michx.; detected a fine locality of this rare grass the past season, (1878) in Peck's Swamp, about three-fourths of a mile from village. A month later found it again in Drowned Lands Swamp.

Trisetum palustre, Torr.; rare; only found in Jno. White (Velie) Swamp.

Aira flexuosa, L.; rather frequent; Sherwood-lot Cliffs, Stissing Mt.; Monument Mt., etc.

Holcus lanatus, L.; scarce; along Wappinger's Creek, near Stanfordville; Myers Meadow, Sudam Place.

Anthoxanthum odoratum, L.; rather common in meadows; Jno. Righter Meadows, etc.

Phalaris arundinacea, L.; common in the marshes, as Hoysradt Marsh, Sackett's Marsh, Keller Bog-hole, etc. *Var.* picta has run wild along border of Booth Swamp.

Paspalum setaceum, Michx., in sandy fields near Mt. Riga.

Panicum filiforme, L.; scarce in a few sandy fields.—P. glabrum, Gaudin; quite common; along D. &. C. R. R. and P. & E. R. R. and in some fields.—P. sanguinale, L.; a most common and troublesome weed, particularly in gardens, in this region.—P. agrostoides, Spreng.; rare; along W. shore of Stissing Point, and occasionally elsewhere.—P. proliferum, Lam. (?) along shores, Thompson Pond, etc.—P. capillare, L.; very common.—P. latifolium, L.; common along base of mountain, etc.—P. clandestinum, L.; very common in low thickets along Shekomeko Ck. and Roelif Jansen's Kill, etc.—P. microcarpon, Muhl.; Little Stissing Mt.—P. xanthophysum, Gray; detected the past season on Mt. Riga, east of old Robert's Place, and Northeast of Monument Mt.—P. dichotomum, L.; very common and exceedingly variable. This species probably includes too much under one name.—P. depauperatum, Muhl.; quite common; Stissing Mt. and also frequent elsewhere.—P. Crus-galli, L.; very common.

Setaria glauca, Beauv.; very common.—S. viridis, Beauv.; rather rare, but found in some cultivated places.

Andropogon furcatus, Muhl.; rather common; W. base of Snake Hill; Risedorf Hill; Attlebury Hill, etc.—A. scoparius, Michx.; common in dry sterile soil.—A. Virginicus, L.; on knolls near ponds, Mt. Riga.

Sorghum nutans, Gray; common; with *Solidago rigida*, E. base of Mt. Ararat, etc.

I am entirely indebted for the accuracy of the foregoing list of Gramineae to my old and esteemed friend, Dr. Geo. Thurber of Passaic, N. J., who has repeatedly examined and corrected suites of Grasses from this region.

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ERRATA.

Lists of errata are given on pages 22, 109, 200, 276, 328, 336, 348.

Besides these: the other more important errors in sense are:

p. 10, after C. grisea. insert “C. gracillima,” Schw.; Yonkers, Howe and Pooley; New Jersey, Austin.
p. 53, not “*Salix*” but *Solea concolor*.
p. 60, § 59. contributed by D. S. Martin.
p. 77. for ‘H. L. Warne” read “H. A. Warne.”
p. 78, l. 3, for “back” read “bark.”
p. 93, l. 20, for “ten” read “the.”
p. 101, l. 12 from foot, for “4” read “9.”
p. 102, l. 6 from foot, for “miltaris” read “aloifolia,”
p. 155, § 156, for “Duchatre” read “Duchartre.”
p. 159, l. 8, for “on” read “or.”
p. 169, l. 3, for “Walson” read “Watson.”
p. 179, § 190, 4 lines from end, for “but” read “not.”
p. 204, l. 7 from foot, for “turgos” read “turgor.”
p. 231, l. 14, dele “under.”
p. 276, l. 15, read “hear say.”
p. 293, § 297, contributed by D. C. Eaton.
p. 300, l. 11, for “Cones” read “Coues.”
p. 307, 19, l. 3, for “as” read “of.”
p. 363, last line, for “present” read “prevent.”

IN HEPATICAE:

See list, p. 52,—also, p. 21, No. 13, for “*Rhossalantnus*,” read “*Rhopalanthus*.”

IN MUSCI:

See lists pp. 52, 96, 160, 200: also:
p. 142, l. 20 from foot, insert “our” before “moss.”
p. 143, l. 11 from foot, for “nigricans” read “nigrescens.”
p. 144, last line, add, No. 11 is *A. tenerrimum*, Mill.

IN ALGAE:

See Lists pp. 116, 200: also p. 203, § 215; also:
p. 140, l. 10 from foot, for “reptans” read “repens.”
p. 158, l. 19 from foot, for “Cryptomenia” read “Cryptonemia.”

NOTICE.

The plate illustrating Vernation in Botrychia should face p. 193; that illustrating Development of Scytonema, 218.

The Pine Plains Catalogue, paged I—XXXII, is complete to end of grasses.